THE
RAILWAY GAZETTE
A Journal of Management, Engineering and Operation
INCORPORATING
The Railway Engineer · TRANSPORT · The Railway News
The Railway Times · Herapath's Railway Journal · RAILWAY RECORD.
RAILWAYS ILLUSTRATED · ESTABLISHED 1835 · THE RAILWAY OFFICIAL GAZETTE

PUBLISHED EVERY FRIDAY
AT
33, TOTHILL STREET, WESTMINSTER, LONDON, S.W.1

Telegraphic Address: "TRAZETTE PARL., LONDON"
Telephone No.: WHITEHALL 9233 (8 lines)

Annual subscription payable in advance and postage free
British Isles and Abroad .....£2 5s. 0d.
Single Copies .....One Shilling
Registered at the General Post Office, London, as a Newspaper

VOL. 83 No. 5 FRIDAY, AUGUST 3, 1945

CONTENTS

	PAGE
Editorial Notes	105
Strengthening the Financial Position of Indian Railways	107
The War Effort of American Railways	107
Road and Rail in Argentina	109
Letters to the Editor	110
The Scrap Heap	111
Overseas Railway Affairs	112
Track and Roadbed for High-Speed Trains	113
Modern Bridging Practice in New Zealand	114
Gauge Unification in Australia	116
Hellenic State Railways in War	119
Modernising London's Underground Signals	122
Personal	123
Transport Services and the War	125
Stock Market and Table	132

DIESEL RAILWAY TRACTION SUPPLEMENT

The August issue of THE RAILWAY GAZETTE *Supplement, illustrating and describing developments in Diesel Railway Traction, is now ready, price* 1*s.*

INDEX

An index to the eighty-second volume of THE RAILWAY GAZETTE *covering the issues from January* 5 *to June* 29, 1945, *has been prepared, and is now available free of charge on application to the Publisher*

POSTING "THE RAILWAY GAZETTE" OVERSEAS

We would remind our readers that there are many overseas countries to which it is not permissible for private individuals to send printed journals and newspapers. THE RAILWAY GAZETTE *possesses the necessary permit and facilities for such dispatch.*

We would emphasise that copies address to places in Great Britain should not be re-directed to places overseas

TO CALLERS AND TELEPHONERS

Until further notice our office hours are: Mondays to Fridays 9.30 *a.m. till* 5.30 *p.m.*

The office is closed on Saturdays

ANSWERS TO ENQUIRIES

By reason of staff shortage due to enlistment, we regret that it is no longer possible for us to answer enquiries involving research, or to supply dates when articles appeared in back numbers, either by telephone or by letter

ERRORS, PAPER, AND PRINTING

Owing to shortage of staff and altered printing arrangements due to the war, and less time available for proof reading, we ask our readers' indulgence for typographical and other errors they may observe from time to time, also for poorer paper and printing compared with pre-war standards

The Change in Government

THE General Election has resulted in the return to power of a Socialist Government with an overwhelming majority over all other parties for the first time in the history of this country. Labour itself has a majority of 180 seats in the House of Commons over all opposition parties, and in total it would appear that the new Government can muster 414 votes against 212 of supporters of the Churchill regime. The new Government faces tasks of unparalleled magnitude in the rehabilitation of the life and trade of the nation and in achievement of lasting peace in international affairs. It has already made known that its approach to these matters is likely to be along lines which hitherto have been considered unorthodox. In the home field the Labour Party is known to favour an extension of State control and direction in its dealings with a number of basic industries, notably perhaps coal mining and transport. Of the need for adjustments to secure greater productivity of the one and increasing co-ordination of the other, there is a wide measure of agreement, even though there may be strong divergency of view as to how these best can be obtained. In grappling with the great tasks which must be faced in the life of the new Parliament, the Government, which represents a very large majority of the voters of the country, will have an unequalled opportunity to prove the effectiveness of principles its spokesmen have long advocated.

* * * *

Dangers of Uncertainty

The published programme of the Labour Party has emphasised that in the event of its return to power it would give early attention to bringing about State control of the Bank of England, coal mines, transport, and the iron and steel industry. Obviously, the change in the Government has been viewed with concern by those who are known to be directly concerned. So fundamental a change in the outlook necessarily must have the effect of introducing uncertainty into the plans which these industries have in hand. The railways have announced their plans for the post-war period. The coal industry also has made known its intention to pursue a progressive policy based on the Foot and Reid reports. The iron and steel industry quite recently has announced a plan of re-equipment and development involving the expenditure of £120,000,000 over the next five years. It is unlikely that any of these schemes involving considerable expenditure by the industries, will be undertaken while the likelihood of Government ownership or control remains. In the interests of all parties, therefore, it is essential that the Government should make known its intentions as soon as possible, and also the means by which it intends to implement them. The repercussions throughout industry of the indefinite deferment of large-scale plans such as the basic industries have evolved undoubtedly will be serious. The sooner the future can be seen with some clarity, the better.

* * * *

An Inauspicious Start

Although there will be no lack of sympathetic consideration accorded any proposals which the new Government may bring forward, and a widespread appreciation of the magnitude of the tasks with which it is faced, it cannot be denied that its early days have been attended by unfortunate conditions. Apart from the brake which its advent has placed on the constructive plans of a number of industries, the election of the Labour Government has been the signal for a considerable selling of securities of many kinds and for falls in stock prices, which cannot fail to cause concern. Both these occurrences reflect apprehension as to the intentions of the Socialist Party and also lack of confidence in the outcome of principles as yet untried. The critical railway labour negotiations, with the threat of a strike to paralyse the movement of travellers over the Bank Holiday weekend, and the "go slow" working by the dock workers, have also helped to make inauspicious the Labour Party's entry into power. The claims of the railwaymen, if conceded, would add many millions of pounds yearly to the already greatly swollen labour bill of the companies, and would make practically inevitable the bankruptcy of the companies under normal conditions. Under a nationalised railway system they would represent a charge on the taxpayer.

* * * *

Compensation for Railway Holders

The belief that the nationalisation of British railways has been brought measurably closer by the election of a Labour Government has caused renewed interest in the terms under which this might be achieved. In *The Financial News* some calculations have been given based on the supposition that the Government would be prepared to purchase the railways and pay existing proprietors in 3 per cent. Government bonds. If the wartime rental were capitalised at 3 per cent., it would give a total purchase price of £1,272 millions. On the same basis, the "standard revenue" would give a capitalisation of £1,723 millions. The former figure would leave nothing for the junior

stockholders if compensation were based on the market prices of stocks. On a "standard revenue" basis all stockholders would fare better, except those with Southern preferred, which would continue to receive the full 5 per cent. If, however, prior charge stockholders insisted that their existing legal right to a given income had to be maintained, they would naturally receive proportionately greater amounts of stock, and on the basis of capitalisation of the present guaranteed annual rental, Great Western ordinary stockholders, for example, would receive only 1·63 per cent. a year. On the basis of capitalisation of the standard revenue, these stockholders would receive 7·3 per cent.

* * * *

Mr. Edward Lowther

The death of Mr. Edward Lowther, J.P., at the age of 86, is recorded elsewhere in this issue, with some biographical details and a portrait. Mr. Lowther retired from active railway service in 1926, when he relinquished the position of Chief Docks Manager, G.W.R. He had a very long experience of railway and dock work, for he had served the railway industry for half a century. It was in 1876, at the age of 17, that he joined the North Eastern Railway, of which eventually he became Chief Inspector of the Mineral Department. In 1900 he was appointed Traffic Manager of the Port Talbot Railway & Docks Company, of which two years later he became General Manager. When it was decided, in pursuance of the grouping arrangements of the Railways Act, 1921, that the Port Talbot undertaking should be acquired by the Great Western Railway, Mr. Lowther was appointed Chief Goods Manager of the Great Western Railway, in anticipation of the absorption of the various South Wales railway companies in the western group. He relinquished that position in 1924, when he became Chief Docks Manager of the G.W.R., which he remained until his retirement two years later.

* * * *

Overseas Railway Traffics

Since last week a fall had taken place in the prices of securities of British-owned railways in Argentina and this has been slightly accentuated in sympathy with the prevailing tendency in markets caused by election results. Argentine railway traffics keep up well and the increases in receipts shown in the third week of the financial year by the Buenos Ayres Great Southern and the Central Argentine are particularly satisfactory. In the same week the Argentine North Eastern has an advance of £1,531 and the Entre Rios one of £5,294. Antofagasta earnings for the first 29 weeks of 1945 amount to £885,130, an improvement of £53,130, but the Nitrate Railways have not been so fortunate. Taltal Railway receipts for the financial year ended June 30, totalling £36,700, show a decrease of £28,630. Brazilian railway receipts are good, as the Leopoldina for the first 29 weeks of 1945 records an advance of £94,671 and the Great Western one of £85,200.

	No. of week	Weekly traffics £	Inc. or dec. £	Aggregate traffic £	Inc. or dec. £
Buenos Ayres & Pacific* ...	3rd	120,500	+ 3,625	359,000	+ 11,125
Buenos Ayres Great Southern*	3rd	197,562	+16,000	560,000	+ 27,813
Buenos Ayres Western* ...	3rd	70,438	+ 4,438	204,063	+ 6,375
Central Argentine*	3rd	188,209	+15,028	547,453	+ 2,862
Canadian Pacific	29th	1,252,200	+36,800	34,757,000	+210,000

* Pesos converted at 16 to £

In the past two weeks the Canadian Pacific Railway has increased its gross earnings to the extent of £139,000. Gross receipts up to July 7 had shown an advance of £71,000.

* * * *

Southern Railway Expenditure

Some details which have been issued by the Southern Railway show that that company has expended £31,212,000 on permanent way and works and on rolling stock during the years 1940 to 1944. The details, which are given in full elsewhere in this issue, indicate that of this total £17,397,000 has been spent on permanent way and works, £7,378,000 on locomotives and rail motor vehicles, £3,355,000 on coaching vehicles, and £3,082,000 on wagons. During the five years 800 miles of track were renewed; some 118,700 tons of rails and 2,415,600 sleepers were used in this work. During the same period 53 new locomotives (including one electric locomotive) were built in Southern Railway workshops; 4,477 locomotives were repaired. The Southern Railway also constructed 130 locomotives for other railways. The expenditure on coaching vehicles covered the construction of 359 and the repair of 61,636 vehicles. As well as building 6,201 wagons and repairing 313,367, the Southern Railway constructed 5,130 wagons for other railways. Government work to the value of approximately £4½ millions also was carried out by the company in its mechanical and marine workshops. The figures, now made public for the first time, give an indication of the activities of the railway during five years in respect of which the issue of the usual peacetime statistical returns has been suspended.

Home Railway Interim Dividends

As was generally expected, the board of directors of the four main-line railway companies and also the London Passenger Transport Board have made no changes in the rates of dividend to be paid on the junior stocks for the first six months of this year. Great Western Railway consolidated ordinary stock receives 2 per cent.; for the full twelve months of 1944 this amount was made up to 4½ per cent. The London Midland & Scottish Railway Company is paying in full on its preference stocks, but once again a decision on the ordinary dividend has been deferred to the end of the year. For 1944 this stock received 2½ per cent. The L.N.E.R. is paying full rates down to and including the 5 per cent. redeemable preference stock, 1955, and 1 per cent. on the 4 per cent. second preference which, after the end of last year, received a final of 1¾ per cent., making a total of 2¾ per cent. for the year. The Southern repeats its 2½ per cent. on the preferred ordinary. After the close of last year 2½ per cent. was paid on the deferred ordinary stock. London Passenger Transport Board "C" stock receives 1¼ per cent. This is the same rate as last year, when it was made up to 3 per cent. for the full twelve months.

* * * *

San Paulo (Brazilian) Railway Company

Both in volume of traffic and in gross receipts the accounts of the San Paulo (Brazilian) Railway Co. Ltd. for the year 1944 constitute a record in the history of the company. The financial result obtained has enabled the directors, while recommending an increase in the ordinary dividend from 2 per cent. to 3 per cent., to reimburse the general reserve with £200,000 out of the £395,000 they took from that reserve for dividends and taxation in the years 1942 and 1943. On the main line of 86½ miles on the 5-ft. 3-in. gauge from Santos to Jundiahy the receipts in 1944 amounted to £3,473,813, an increase of £1,154,854, and the working expenses were £2,997,310, or 86·28 per cent. of the gross receipts as compared with 89·85 per cent. in 1943. The profit on working this section was therefore £476,503, compared with £143,089. On the other hand there was a loss of £12,863, compared with a loss of £11,206, on working the Bragantina line of 67 miles on the 3-ft. 6-in. gauge. After prolonged negotiations with the Federal Government of Brazil, the provisions of Decree No. 16842 of March 24, 1925, have been applied to the company's railway by Decree No. 7221 of December 30, 1944. Under the terms of this decree the rates chargeable by the company bear a surcharge of 10 per cent. as from July 1, 1945, and will be devoted to the electrification of the main line for the 37 miles between San Paulo and Jundiahy, where there is a junction with the electrified 5-ft. 3-in. gauge line of the Paulista Railway.

* * * *

State Railway Operation for Luxembourg

In accordance with a recent Grand-Ducal Decree, the operation of all standard-gauge and narrow-gauge railways in Luxembourg, including the Rodange-Athus line, has been taken over by the Luxembourg State Administration as from June. This administration is to work the railways on account of the owning companies concerned. Two supervisory authorities have been established, namely, an administrative council and a managerial council. The exact intention behind this measure is not clear. It will be remembered that the two main systems of privately-owned railways in Luxembourg before the war were those of the Prince Henri Railway Company and the Guillaume-Luxembourg Railway Company. They were absorbed into the Reichsbahn during the German occupation, on January 1, 1942, and on April 1 of the same year, respectively. Particulars were published in *The Railway Gazette* for October 23, 1942 (page 405). In addition, the narrow-gauge railways were incorporated into the Reichsbahn system, and all the Luxembourg railways were attached to the Saarbrücken Reichsbahn management. Germany redeemed the debenture loan of the Prince Henri Railway, paying the debenture-holders the nominal value only, although the amounts were not placed at their disposal but were paid into a blocked account in Berlin.

* * * *

The Destruction of the Greek Railways

A particularly striking example of the systematic and intensive destruction by the retreating Germans of the railways of occupied countries is provided by the article we publish this week by the Acting General Manager of the Hellenic State Railways. This work in Greece was begun on October 12 last, and the heavy demolitions clearly were designed to put the railway system out of action for some years. The destructive achievements of the Germans are indicated statistically in two tables prepared by Mr. Leondopoulos. At the moment, the only pre-war State Railway lines working appear to be the 215 miles between Rodopolis and Alexandroupolis (which, being under

Bulgarian control, suffered no damage), and 43 miles between Agra (Edessa) and Armenohorion. To the former must now be added the 115 miles of the Franco-Hellenic Railway (Alexandroupolis to Svilengrad) taken over by the Greek Government on April 18 last. It will be noticed that no mention is made of the Piræus, Athens & Peloponnesus Railway, the working of which was reported in June, 1940, to have been taken over by the Hellenic State Railways. Possibly this was a temporary wartime measure. We learn from Mr. Leondopoulos that the only sections working are Athens to Megara; Corinth to Argos and Nauplia; and Patras to Olympia. It was announced by the Athens radio on June 11 that the Greek Ministry of Transport had asked Great Britain to supply from Alexandria a mobile railway bridge for temporary use across the Corinth Canal.

* * * *

High Speed with Comfort and Safety

The need for strengthening and improving the roadbed and track as a preliminary to the introduction of high-speed train services has become increasingly apparent during the past fifteen years. If these services are to be developed still further, and to retain the popularity they have already achieved, not only must passengers be assured of reliability with absolute safety, but the standard of comfort previously afforded must be maintained at speeds even exceeding 100 m.p.h. In a recent work on the subject, from which we give an abstract on page 113 of this issue, the Chief Engineer of the Baldwin Locomotive Works describes the measures advocated in the United States to bring the track up to the required standard. The subsequent work of maintenance, besides involving constant supervision and a high degree of accuracy, calls for a considerable revision in long-established engineering practice, if the reliability of the services is not to suffer through the imposition of speed restrictions. That these costly improvements benefit only a small proportion of the traffic cannot be denied; but such expenditure is unavoidable if the development of high-speed train services is not to be retarded.

* * * *

Replacing Signals on London's Underground

When the electrification of London's District Railway was taken in hand, under American auspices, it was decided to instal the electro-pneumatic system of power interlocking and automatic signalling. The same apparatus was also selected for the associated tube undertakings; the Bakerloo, Piccadilly and Hampstead lines. Semaphores, of a particularly neat design, were used on the open sections of line and in some of the stations, but in the tunnels spectacle frames were moved up and down by air cylinders in front of the lamps, all of which originally burned oil. This method of working really amounted in principle to adding power to the arrangements long used with mechanical signalling on the old Underground and early tube routes. The apparatus was well-designed and constructed, and functioned satisfactorily, so much so that many of the mechanisms are still in use although they are giving place—and have been doing so for some time—to the simpler colour light signal, thus eliminating a number of moving parts and reducing chances of failure and maintenance costs. An illustrated article on page 122 gives details of the change in equipment. It is of interest to note that on the Great Northern and City Railway, opened early in 1904, all the tunnel signals were plain colour lights and had their control relays housed in the stations, the first example of automatic tube signalling in this country.

* * * *

American Success with Roller Bearings

Between 1939 and 1944 freight traffic on the Chicago, Rock Island & Pacific Railway was doubled, and passenger traffic was increased fivefold. The bulk of this record-breaking demand for transport was borne by the company's steam locomotives, which in consequence had to be maintained at the highest pitch of efficiency to enable them to carry out their formidable tasks. Of the steam locomotive stock, the most notable contribution was made by ten new 4-8-4 locomotives built by the American Locomotive Company in 1944 and 100 rebuilt engines of the 4-8-4, 4-8-2, and 2-8-2 types. It is noteworthy that all of these 110 locomotives, as recorded in our American contemporary *Railway Age*, were equipped with Timken roller bearings. In most of them, moreover, the valve gears were provided with needle bearings at all major points. It has been found by experience that one of the great advantages conferred by roller bearings on the coupled axles is that the centre distances between the axles, and hence between the coupling rod pins, are kept constant, to a far greater degree than when ordinary axleboxes are used; thus the average mileage between tyre turnings has been more than doubled; moreover the life of the coupling rod bushes (normally a heavy item in running shed maintenance) is very greatly augmented. The needle rollers in the valve gear components have also helped to maintain a high level of accuracy in valve events, with consequent benefit to the performance of the locomotives in service.

Strengthening the Financial Position of Indian Railways

IN India, as in other countries, many extensive remodelling works and the provision of additional lines of communication have had to be undertaken by the railways during the war, though such works would not normally have had to be carried out. The costs of these works have been inordinately high, and had they been charged, as usual, to capital and to the depreciation fund, over-capitalisation and undue depletion of that fund would have resulted. The Government of India, therefore, has decided that 50 per cent. of the expenditure on all important items of such works should be debitable to working expenses if incurred since March 31, 1943, and provided that these works are not chargeable to military estimates. In the latter case, it has been agreed that railways will pay for all recoverable material, and the War Department for the remainder. On March 31 last the railways' share of this expenditure totalled about Rs. 3 crores (£2¼ million) and had been charged to capital, but is now being transferred as a debit to working expenses.

Allocation of expenditure on rolling stock replacements is also to be modified to suit abnormal wartime conditions. Under existing rules, the tractive effort of a new locomotive and the capacity of a new wagon are compared, on an individual unit basis, with those of the vehicles they replace, and part of the cost of each proportionate to its increased capacity is normally charged to capital and the balance to the depreciation fund. When, however, as at present, there is wide disparity between the power of the old and new locomotives and the capacities of the replaced and new wagons, capital receives credit for the original cost of the replaced vehicles and is debited with the cost of an equivalent capacity or tractive effort at the new prices. As a result, the scale of present replacements and wide difference between present and original costs together involve a considerable increase in capital-at-charge without a correspondingly enhanced tractive effort or capacity. The drain on the depreciation fund in bearing the full cost of replacement would also be such as to make it impossible for the fund to meet the demands for replacement and rehabilitation expenditure after the war.

The new measure, therefore, provides (1) that in future there shall be no charge on capital unless there is an increase in the aggregate capacity after making allowance for difference in the estimated lives of the old and new stock, (2) that the debits to the depreciation fund shall be limited to the amount accumulated in it for the items replaced, (3) that the difference between the accumulations in that fund and the original cost shall be charged to the railway reserve fund, and (4) that the balance be charged to working expenses.

The effect of the revised ruling is that out of a total expenditure of Rs. 94¾ crores (roughly £71 million) on locomotives and wagons, instead of Rs. 16 crores (£12 million) being debited to capital and Rs. 78⅜ crores (£59 million) to the depreciation fund, only one crore (£¾ million) will be charged to capital, and Rs. 22 crores (£16½ million) to the depreciation fund; the remainder of the cost will be distributed between the railway reserve fund, Rs. 10½ crores (£7⅞ million); and working expenses, Rs. 61¼ crores (£46 million). To strengthen further the railways' financial position and meet present abnormal arrears of maintenance, Rs. 5 crores (£3¾ million) have been set aside from the 1944-45 surplus, and in future years other sums will be similarly provided such as reviews of the situation from time to time may deem necessary.

* * * *

The War Effort of American Railways

MR. JAMES V. FORRESTAL, Secretary of the United States Navy, in a tribute* to the wartime effort of his country's railways, says: "I share the admiration everyone must feel" in "the physical and mechanical operation of America's railroad transportation machine." . . . . "Unselfish teamwork has made possible the achievements" [of the various lines]. Their effort in aggregate was certainly tremendous. For instance, in 1943, of the 1,000,000 million ton-miles hauled in the States by all forms of transport, 730,000 millions are creditable to the railways, a figure six times as great as that of the next largest freight carrier, the Great Lakes shipping, and fifteen times that of all the inter-city road hauliers combined. Similarly, of the 23½ million troops carried in organised movements by rail and road in the 2½ years ended June, 1944, 97¾ per cent. travelled

* In his introduction to "Railroads at War" by S. Kip Fairington, Jr. Samuel Curl, Inc., New York, U.S.A.

by train and only 2¼ per cent. by road. In handling 173,400,000 tons of Army freight and express in this period, the railways transported 12 times the volume moved by road.

In general, what strikes one forcibly as the most cogent reason why the railways in the United States were in a position to rise to the occasion and grapple successfully with this vast traffic was their pre-war standard of efficiency and equipment. This is the more remarkable when one remembers the long lean years and greatly reduced rolling stock on all systems. Yet heavier tonnage was carried with reduced train-mileage in many cases, thanks to more efficient methods of operation, including locomotives of higher efficiency and modern equipment of all kinds. Better track, improved signalling and locomotive design contributed to the happy position in which—thanks to their own foresight—the various railways found themselves at the outbreak of hostilities. To mention but one detail, roller-bearing equipment, which has been greatly increased during the last few years, has insured enhanced reliability, longer engine runs, and easier haulage, and it is claimed that car-starting resistance has been reduced on one railway by as much as 90 per cent. and on another from 43 lb. to 1·5 lb. per ton where such bearings are fitted.

If there is one item of equipment that, more than any other, has enabled American railways to cope with the war situation, it is centralised traffic control. Before 1942 some 2,660 miles had been equipped with this remote form of control, but in 1942 and 1943 alone a further 1,600 miles were installed. This is not surprising, as C.T.C. increases single-line capacity to 75 per cent. that of double line, and steel for track doubling was almost unprocurable. With the long passing loops in the U.S.A., a high percentage of centrally-controlled train crossings take place without stopping either train concerned.

As compared with the 1914-18 war, total traffic in the three-year period 1940-42 was six times greater than that moved over American lines in 1916-18, in spite of the fact that they were allowed to purchase only one-third the number of locomotives and three-quarters of the number of freight cars obtained in the earlier period. Troop movements also have been more than four times heavier than in 1917-18, an average of over 200 troop trains having been run daily during 1942-43. It may be noted that during the first world war such trains consisted of day coaches and were timed to run at about 35 m.p.h., whereas in this war they are made up almost exclusively of Pullman and tourist-sleeping cars, with the result that one-half of all the Pullman sleepers and one-fifth of all railway coaches have been monopolised by troop movements.

Many new transport problems had to be solved, including reversal of the direction of the peacetime flow of traffic on many lines. This was because, in some cases, so many war plants, military camps and airfields were concentrated near the Pacific coast. Much of the war transport was towards the Far East, and these two conditions combined to create an east to west instead of west to east predominating flow. Each railway solved these problems satisfactorily in its own way. The Southern Pacific Railroad, which had spent $170,000,000 on improving its Pacific lines alone between 1929 and 1942, was able to double its revenue passenger-mileage as between those years. The Santa Fe Railroad, among other measures, concentrated on increasing the utilisation of its locomotives; the maximum achieved in one month was 20,290 miles for a passenger engine and 10,379 miles for a freight locomotive. Water-softening increased the period between wash outs to 30 days and so contributed to these results. The Chesapeake & Ohio administration also spent large sums on improvements and equipment, especially between 1936 and 1939, thus enabling freight train speeds to be increased by 65 per cent.; gross ton-miles hauled increased by 191 per cent.; freight train loads by 78 per cent.; and the average tractive effort of its locomotives was increased by 40 per cent.

In 1942 the U-boat menace suddenly cut off from the U.S.A. the normal flow of iron ore from South America to the Maryland steel plants, and also called a halt to the transport of coal from the southern to the northern States in coastwise shipping. As a result, the Minnesota iron range, near the Canadian border, was called on to supply 99 per cent. of all the iron ore milled in the country, and this demanded greatly increased transport over the Duluth, Missabe & Iron Range, Great Northern, Northern Pacific, and Soo lines from Minnesota to the Great Lakes, and also onwards to the Pittsburg area. In 1942 the four railways named above carried as many as 92,000,000 tons of ore, of which the share of the "Iron Range" road was 45,000,000 tons. During the shorter ice-free season on The Lakes in 1943, the Great Northern Railway, for instance, carried 25,000,000 tons, generally in 10 trains daily, most of them a mile long and weighing 11,000 tons. As a substitute for coastal shipping, coal, instead of being carried to south-eastern ports, had to be re-routed over unfamiliar lines northwards.

Before the 1,400-mile "Big Inch" 24-in. pipe line was laid from Texas to Philadelphia, the railways were carrying 934,000 barrels of oil daily to the east, and even after its completion they still had to handle over 600,000 barrels a day. During the pipe laying, a temporary halt of 6½ months was necessitated when pipehead reached Norris City, but thanks to prompt action by the New York Central administration no interruption in the flow eastwards occurred. Though only a single line was available, 124,193 tank loads were hauled over it during this period, thanks mainly to elaborate and extensive filling facilities and sidings installed at short notice.

The effect of the war on some of the other railroads is strikingly illustrated by the following figures:—

	1938	1943
Southern Railway System		
Ton-mileage	6,250 million	15,333 million
Average freight per train	433 tons	608 tons
Average car load	19·5 tons	29 tons
Rock Island Lines	Increase between 1939 and 1943	
Freight traffic	300 per cent.	
Average car load	10 ,,	
Norfolk & Western Railway		
Freight traffic	90 ,,	
Coal traffic	38 ,,	
Richmond, Fredericksburg & Potomac RR.	Increase between 1940 and 1943	
Ton-mileage	229 per cent.	
Train-mileage	76 ,,	

As an example of how these increases were secured, the N. & W.RR. installed 120 miles of C.T.C., doubled 10 miles of its Shenandoah line, and remodelled Roanoke yard to provide a double-line hump and 154 miles of sidings. Even on the little R., F. & P.RR., Potomac yard handled 266,166 cars in a single month, May, 1943.

On the passenger side, the Philadelphia-Washington section of the Pennsylvania Railroad, which by dint of keying up had managed to carry 67,000 passengers in a 24-hr. period at the times of successive Presidential Inaugurations in 1937 and 1941, steadily increased its capacity under war conditions until in December, 1943, it handled 179,000 daily. The New York terminal of this system dealt with 99,000,000 passengers in 1943 as against 61,000,000 in 1941, some 900 trains entering and leaving it every 24 hr. On the Southern Railway also passenger-miles increased by 439 per cent. between 1938 and 1943, and the Norfolk & Western system increased its passenger traffic by the phenomenal figure of 860 per cent. in the four years ended 1943. In the three previous years the Richmond, Fredericksburg & Potomac line achieved an increase of 458 per cent. The other railways also contributed their quotas of super-efficiency, and the whole rail transport machine is now geared up to a record degree in the national war effort.

* * * *

Gauge Unification in Australia

WHATEVER doubts may previously have been entertained as to the need for unifying the Australian railway gauges—and there were many sceptics, even among railwaymen—have been largely removed by the lessons of the present war. With modern equipment, a determined enemy could land on Australia or its territories almost without warning. No matter how brave or well-trained the defending forces may be, they are of little value until transported within striking distance of the enemy, and even then they must be assured of supplies by communications of ample capacity. No enemy in his senses would attack Australia without having superiority of sea and air power; defending armies must depend, therefore, largely on land transport—mainly by railway. The recent war in Europe has proved time and again the decisive importance of railways. Moreover, in Australia the railways are the only transport medium not dependent on imported fuel.

Realising the vital importance of the subject, the Commonwealth Government deputed Sir Harold Clapp, K.B.E., to investigate and report on the unification of gauges. His report, which was submitted recently to the Commonwealth Authorities, is summarised on page 116. It emphasises that the justification for gauge standardisation must rest primarily on defence rather than on economic grounds, and the proposals were framed after due consultation with the Army Authorities. Economic and developmental aspects were also surveyed closely. Briefly, the recommendations comprise conversion of practically all broad-gauge lines

in Victoria and South Australia, together with new construction or conversions to provide standard-gauge connections between—

(*a*) Fremantle, Perth, and Kalgoorlie ;
(*b*) Port Pirie and Broken Hill ;
(*c*) Bourke (N.S.W.) to a point on the Townsville-Mt.Isa line, which is to be converted, and connected *via* the Barkly Tableland to Darwin.

The conversion of the remaining lines in Queensland and in Western Australia is not recommended pending the completion of the main conversion scheme, while it is not suggested that any change be made in Tasmania, where the 3 ft. 6 in. gauge is in operation.

Sir Harold was not asked to report on financial aspects as affecting the division of expenditure between the Commonwealth and States. Agreement upon this point, being vital to the scheme, now calls for attention. The estimated cost attributable to the main proposal, *i.e.*, excluding any general conversion in Queensland and Western Australia, is £76,752,000, including £21,484,450 on the Victorian System, distributed as follows :—

Year	Tracks and structures	Locomotives and rolling stock
	£	£
1	978,000	309,709
2	816,500	877,816
3	1,294,600	827,815
4	2,102,377	961,531
5	3,345,675	1,133,833
6	3,283,900	1,133,833
7	3,306,000	1,020,023
8	92,838	—
	£15,219,890	£6,264,560

These estimates, however, do not represent the full expenditure necessary for the conversion to be effective. For example, in all systems there is a cessation or lag in the replacement of rolling stock, due largely to the war, which will need to be overtaken in conjunction with the conversion scheme. These associated works will involve a further expenditure estimated at £14,903,845, of which the Victorian portion is £10,152,605, including £1,103,025 for a new locomotive depot at South Kensington. The total cost of the main scheme is estimated accordingly at over £91 million. Unification is primarily a national undertaking, and it is hoped that the Federal and State Governments will succeed in reaching agreement as to finance so that this unprecedented opportunity may not be lost.

* * * *

Road and Rail in Argentina

DURING nearly six years of war, the Argentine broad-gauge railways have not only recovered passenger traffic which they lost to the roads, but have also made considerable gains besides. The chief reasons for the temporary cessation of road competition are well known, but it is doubtful whether the extent of the impressive growth of the passenger traffic carried by the four British-owned broad-gauge lines since 1939 is fully realised. The actual figures are as follow :—

NUMBER OF PASSENGERS CARRIED

	1943-44	1939-40 (000 omitted)	Increase	Per cent.
Central Argentine	70,894	53,894	17,000	31·5
Buenos Ayres Great Southern ...	62,475	57,602	4,873	8·5
Buenos Ayres Western	37,748	24,865	12,883	51·8
Buenos Ayres & Pacific	18,268	14,336	3,932	27·4

At first sight, it might be conjectured that the remarkable increases on the Central Argentine and Buenos Ayres Western might be the outcome of a change in the method of computing the number of journeys per season ticket, but the corresponding figures of receipts amply confirm that there has been a very substantial growth of traffic :—

TOTAL PASSENGER RECEIPTS

	1943-44	1939-40 (000 omitted)	Increase	Per cent.
	£	£	£	
Central Argentine	3,077	2,302	775	33·6
Buenos Ayres Great Southern ...	3,110	2,755	355	12·9
Buenos Ayres Western	1,191	830	361	43·5
Buenos Ayres & Pacific	1,283	866	417	48·2

The Buenos Ayres Great Southern and Buenos Ayres & Pacific suburban services are mainly steam-operated, but the Central Argentine and Buenos Ayres Western suburban lines are electrified throughout. When the city buses and trams were hard hit by the cessation of imports of petrol, rubber tyres, and spare parts for transport machinery of all kinds, increasingly large numbers of Buenos Aires suburban travellers had to rely on the main-line railways and the electrified lines evidently attracted the bulk of the increased load. Long before the war, the unquestioned superiority of electrified services had enabled the Central Argentine and Buenos Ayres Western companies to hold their own comfortably against the indifferent buses and trams, and when those services had to be curtailed during the war—in some cases suspended altogether—it was not surprising that those main-line railways which were electrified should have had to satisfy the major part of the city transport demands.

However, it would be a mistake to conclude that the whole of the increased passenger traffic of the broad-gauge railways was suburban in origin. Towards the close of the war with Germany, public road transport had been almost eliminated in the provinces. The main-line passenger services of the railways had to be restricted considerably also, through scarcity of fuel, but trains which were inadequate to deal with all the traffic offering had little difficulty in securing full loads, often greatly in excess of their maximum capacity. With the gradual resumption of road motor transport services, following the end of the war with Germany, it is not to be expected that the railways will retain all the additional passenger traffic which they carried under the duress of wartime limitations, but it is unlikely that the Buenos Aires suburban services will carry fewer passengers. The Argentine capital is growing apace and will continue to do so, as the country is entering one of those spells of commercial and industrial activity which have marked its economic history at regular intervals for more than a hundred years. Indeed, so far as suburban passenger business is concerned, the problem will be not one of competition between one form of city transport and another, but how to deal adequately with the traffic offering—a problem which confronts other world capitals besides Buenos Aires.

* * * *

The Non-Smoking Compartment

ONE of the minor problems that has resulted from the war is the difficulty of preserving non-smoking compartments for non-smokers. The movements of large bodies of the Services and the overcrowding of nearly all trains has tended to break down the sanctity of the few compartments reserved for persons who do not like tobacco smoke, or who even find it an irritant to their constitution. Moreover, the course of war always appears to reduce the practice of courtesy and consideration for others and these smaller restrictions on conduct are bound to suffer in the process.

It requires a hardy and courageous character to refuse a modest request for permission to smoke, especially if the petitioner is in uniform. There is, unfortunately, a large class of traveller who believes it does not matter in the slightest whether the compartment is labelled " non-smoking." These are the cases which really arouse the ire of the non-smoker.

The only case of real courage we have met with recently was that of an elderly lady, obviously a retired female Don from Oxford. The compartment was filled with Americans and their girl friends who proceeded to light up. The old lady merely said " Not a smoking compartment." This put the young ones in a flutter and there were insincere murmurs of " Oh, we didn't notice." Putting on her most donnish voice the lady said " Written up plainly enough for you to read, isn't it?" But we are not all built like that.

However, the companies will have to decide what action they are going to take in preserving the rights of their passengers. It would seem that mere appeal by posters is insufficient. We shall be interested in the remedy, for, whether we smoke or not, we recognise that there is a considerable section of the travelling public which needs protecting from what is distasteful to it.

RAILWAY CHARGES AND COSTS.—In an editorial article entitled " Railway Charges and Costs " in our July 20 issue, one of the main points of the policy of the National Road Transport Federation was stated to be " to confer with other forms of inland transport, to secure that state of inland transport that will afford the maximum benefit for the public at large, and provide an economic loss for the most extensive and comprehensive transport services in the best national interest." The phrase " economic loss " should have been " economic basis."

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

Standardisation of Wagons

July 28

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—One of the chief claims made by the railway companies in connection with the railway grouping which took place in 1921 was that they would be able to standardise their rolling stock, and enormously reduce the number of types. After the lapse of 24 years, that seems somewhat strange now, when we find that within the last few years there have been introduced on to the lines not less than six different types of a plain and simple 16-ton coal wagon of steel construction.

Not only is the first capital cost enormously increased by this kind of thing, but the repair bill over the next 30 years will be a very big item, due to the fact that so many different patterns will have to be kept continually in stock to meet the requirements of these differing types, as they come into the repair shops.

If the railways are now to be nationalised, as seems likely, one can only hope, in the national interest, that there will be some one in authority who will put an end to this continued folly.

The claim, also made recently, that a national pool of wagons is to be desired, causes one to wonder why, as these vehicles will be expected to run anywhere and everywhere, carrying the same traffic, the London & North Eastern Railway builds one type, and the London Midland & Scottish Railway proceeds immediately afterwards to design another type.

Yours, etc.,
OBSERVER

Cold-Rolling of Steel

1, Broadwood Avenue, Ruislip,
Middlesex. July 26

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—In your editorial headed "Cold-Rolling of Steel," in *The Railway Gazette* for July 20, reference is made to cold-rolling of axles as being recently applied to wheel seats. You also refer to the object of such cold-rolling as being primarily to smooth out surface scratches and abrasions and, as secondary considerations, to improve resistance to fatigue stresses and to produce a harder structure. Surely the main object of the process is to improve fatigue resistance. Scratches and abrasions could be removed equally well by grinding, while hardness of a wheel seat is not a particularly relevant factor.

The process is by no means new and has been latterly extensively adopted in the United States for wheel seats of axles. The matter is referred to in my recent paper before the Institution of Locomotive Engineers—"Notes on Axle Design and Performance." It is the case that London Transport has adopted this practice as long ago as 1938 and by 1939 had so treated more axles than had the whole of the railways in the United States.

Yours truly,
D. W. SPENCER

Movements & Transportation Division, S.E.A.C.

South East Asia Command Headquarters,
July 21

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—We have just received by way of the War Office 30 copies of the reprint of the photograph of the staff of the Movements & Transportation Division of this Headquarters, which appeared in your issue of June 1, 1945.

The American and British members of the staff are very glad to have a copy of this photograph to take home with them. They join me in expressing my appreciation of your courtesy in making the special reprints available to us.

Yours faithfully,
R. MONTAGUE JONES,
Brigadier, D.Q.M.C., (Mov. & Tn.)

"Consecutive-Number" Stations

C/o Chief General Manager,
London & North Eastern Railway
H.Q.1. (Via Hitchin). July 27

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Regarding Mr. F. W. Roberts' letter on page 85 of your July 27 issue, I am tempted to suggest :—

8	Ayton
18	"
11	Leven

Yours sincerely,
O. H. CORBLE

(To make the matter clear we reprint the list sent by Mr. Roberts.

1	—
2	Two Waters (bus only)
3	Three Bridges
4	Four Oaks
5	Five Ways
6	Six Mile Bottom
7	Seven Kings
8	—
9	Nine Mile Point
10	Tenby
20	Twenty

Further suggestions are invited.—Ed., *R.G.*)

Publications Received

Proceedings of the Signal & Telegraph Technical Society (Liverpool Branch), 1943-1944. 13 in. × 8¼ in. 74 pp., with numerous diagrams. Obtainable from the Hon. Secretary, L. Halden, 11, Leda Street, Liverpool, 7. Price 2s. 6d.

This second issue of the Journal of the Liverpool Branch of the Signal & Telegraph Technical Society, referemce to the work of which was made in our issue of July 28, 1944, shows that the expectations raised by the contents of the first number have been fully realised. The present issue contains a varied assortment of informative material and opens with an address delivered by the Chairman, Mr. T. W. Rickett at the annual general meeting. There is a paper on electrical and mechanical interlocking, illustrated by detailed reference to several types of locking frame (some of which would hardly have been known to those employed on lines outside a certain area) with comments on maintenance difficulties and the uses to which certain locking combinations are put.

Another paper deals with the constructional details and another with the design of mechanical signalling equipment, in a manner at once instructive and interesting. Every important aspect of these questions is touched upon and illustrated by sketches in a clear manner, especially helpful to those engaged in the task of keeping such equipment in order. The teleprinter, now so much used by the railways, forms the subject of another paper, and the important questions of carrier telephony and testing are excellently handled. The electro-pneumatic signalling at Southport, installed by the former Lancashire & Yorkshire Railway, is ably described. The issue has been produced, as was the last one, by most creditable efforts on the part of certain members of the Society and much pains has been bestowed on it. The illustrations are all well-chosen and carefully drawn. The publication can be recommended, not only to those engaged in signal and telegraph departments but to others interested in signalling.

Retrospect : J. Parkinson & Son.—We have received from J. Parkinson & Son of Shipley, Yorks, a copy of a booklet entitled "Retrospect," which records the story of the firm from the early '70s. It has been written by Mr. Ernest Parkinson, son of the founder of the firm, and, although intended for circulation amongst the firm's employees, it should appeal to all interested in the development of the British machine tool industry. The business may be said to have begun as a shop where sewing machines were sold, serviced, and repaired. The construction of sewing machines, and equipment for other purposes, was undertaken subsequently, and eventually the firm undertook the construction of machine tools for its own use and for sale to others Parkinson lathes played their part in the early days of the cycle-making industry in the Midlands, and the story of the well-known Parkinson "Perfect" vice makes interesting reading.

Engineering Handbook. We have received a copy of the Engineering Handbook issued by British Timken Limited of Birmingham, and the Fischer Bearings Co. Ltd. of Wolverhampton. The book consists of two sections, the first of which comprises 172 pages dealing with the ball and roller bearings manufactured by British Timken Limited. The second section, of 107 pages, covers the products of the Fischer Bearings Co. Ld. A pocket is provided inside the back cover, containing a 10-page F.B.C. price list, and 30 sheets of sectional drawings of Timken bearings of all types. The book is much more than a well-produced catalogue; it is a complete treatise on the design and mounting of ball-and-roller bearings. The information given covers the practical experience of 50 years and includes notes on selection of bearings for various purposes, lubrication, sealing, fitting, machining tolerances, and typical calculations. A set of inch and metric conversion tables is included and both sections of the book are fully indexed.

The Scrap Heap

A foreman in the mechanical workshops of the South African Railways & Harbours at Durban, who is to retire shortly on reaching the age limit, entered railway service in South Africa in 1897, when nearly 12 years old, at one penny an hour as a boy in the workshops. His present salary is £660 a year. His career comes in the record class, and he has received a congratulatory letter from the General Manager.

* * *

THEN AND NOW

A journey a day or two ago in a holiday train brought to mind "Groan 1" of Macaulay's "Miseries of Human Life" a hundred and two years ago. "The Brighton Railway; in a slow train; a carriage crowded as full as it would hold; a sick lady smelling of ether; a healthy gentleman smelling of brandy; the thermometer at 102 degrees in the shade, and 1 not in the shade, but exposed to the full glare of the sun from noon till half after two, the effect of which is that my white trowsers have been scorched into a pair of very serviceable nankeens." As it was then, so it is today.—*From "The Manchester Guardian."*

* * *

WHY SOME TARGET DATES ARE FUTILE

Commenting on aspects of wartime railway operation in Bengal and Assam—under both Indian and American auspices—"R.O.C.," writing recently in the *North Western Railway Magazine,* quotes, as an example, that the completion of a bridge was held up for want of the girder spans, which "had been despatched, lost, discovered by a search party in some railway backwater, despatched once more, and they were (at last) at a nearby junction. They left, arrived, gave a passing nod as it were, and passed on, borne on the flow of military stores. Fifty miles further on they were intercepted and reversed. Again, caught in the flow of returning empties, they romped by, coming to rest where they had been a week previously.

"At the third attempt they were lassoed and diverted into a siding. There they sulked. Could they be got to the site of the work? Promises of work-train blocks proved to be *Derzi's* promises (unfulfilled). Labour, skilled and otherwise, organised for unloading at the appointed time and date, wasted precious time in idleness. Contractor sent in claims. Priceless time was lost. Accusations and counter-accusations sped to and fro. People asked cynically who we were supposed to be fighting. Target dates underwent one more revision."

* * *

"MACING THE RATTLER"

"Macing the Rattler" is an old and honoured practice. It means cheating the railway, the "rattler" being the train itself and "macing" being the equivalent of not paying your fare. In pre-war days, and, to some extent, nowadays, in the racing season, the approach to platforms from which race trains depart was dotted with men in varying degrees of impecuniosity. They are members of the band of hope who expect to "touch" for the fare from some better financially-equipped tradesmen. The unfortunate ones "mace the rattler." They use out-of-date or slightly obliterated short-distance tickets to get by the ticket inspectors on the gate. They are at their best when the train is almost due to leave. They bustle through with the throng when the inspector can barely keep pace with the customers. Many of them get on to adjoining platforms and, crossing the line, enter the compartments of the race-train from the off-side.—*From "One More Shake," by W. Buchanan-Taylor.*

* * *

100 YEARS AGO

From THE RAILWAY TIMES, *August* 2, 1845

CHESTER and BIRKENHEAD RAILWAY.—EXPRESS TRAIN BETWEEN BIRKENHEAD and BIRMINGHAM, LONDON.

On and after the 1st day of August next, the EXPRESS TRAIN for Birkenhead will leave

	H. M.	
London . .. at	4 0 p.m.	Fare, 47s. 6d.
Birmingham	7 10 „	„ 20s. 6d.

And the Train from Birkenhead for Birmingham and London will leave at 3 h. 45 m. p.m.

JOHN B. WILCOX, Treasurer.

Birkenhead, 30th July, 1845.

"TIME SIGNAL!"

"It must be half past nine, There goes Mr. Bloggs with his throttle open and all back pegs off!"

RAILWAY QUESTIONS AND ANSWERS

Statement.—Why have the railways done practically nothing to modernise their stations in London and the great provincial cities?

Answer.—Hundreds of British railway stations have been completely rebuilt or modernised since the last war, but much of this work was damaged or destroyed by air attacks between 1940-45. Stations which were rebuilt include Cardiff, Exeter, Leamington, Leeds, Luton, Margate, Ramsgate, Richmond, Shenfield, Surbiton, Swansea and many in London. Schemes for the rebuilding of other important stations which had to be deferred on the outbreak of war will be resumed as soon as conditions (manpower and the supply of materials) permit. The rebuilding of any big station such as Paddington, Euston, Kings Cross or Waterloo, is a major undertaking costing several millions of pounds and taking two or three years to complete. Such schemes have to be considered in relation to other essential works. Of the railway expenditure of £450,000,000 on new works, modernisation and re-equipment between 1923 and 1939, £170,000,000 was spent on rolling stock and nearly £100,000,000 on the permanent way. The argument which is sometimes advanced that London Transport stations are nearly all modern structures ignores the fact that practically all these stations have been built within the present century; and the construction of a tube surface station is a very much smaller and less complex building job than that of, say, Euston, with its 15 platforms, headquarters offices, waiting rooms, restaurants, and so on, which covers many acres compared with the fraction of an acre of the average London Transport station.—*From "Answers to Questions and Statements," issued by the British Main-Line Railway Companies,* 22, *Palace Chambers, London, S.W.1.*

* * *

When nine boys were summoned at Willesden juvenile court on July 20 for trespassing on the L.M.S.R. near Willesden Junction, it was stated that troops returning from Europe were in the habit of throwing out foreign coins to the boys who scampered over the tracks to pick them up. In one instance a train had to be stopped to avoid running the boys down. Eight of the boys' parents had to pay fines of 15s. each and the other boy was remanded.

* * *

GOERING AND GERMAN WAR LOCOMOTIVES

The problem of the German war locomotives seems to have been of particular interest to Goering. His diary (which ends abruptly with an entry dated August 8, 1942) has an entry dated March 4, 1942, relating to the problem of the building programme of the war locomotives designed to relieve the serious shortage of engines then being felt in Germany and German-controlled countries. The entry is headed "Dorpmüller, - Speer, - Pleyer - Gornnert." The entry reads (translated): "Problem of locomotive building to attain high output. Order concerning the building of war locomotives. Commission for the simplification of locomotives. Order for 15,000 locomotives spread over two years. Dilution of order over a great number of places. Organisation of stocks of materials. Adaptation of locomotive and wagon building to the new economic system. Diversion of the conveyance of coal to inland shipping."

* * *

TAIL PIECE

"LOST LEADER"

For us you lit the lights about the town:
For us you won the right to throw you down.
Not all of us can hail the "Kingdom Come,"
We think of 1940, and are dumb.
A Party's happy—and a planet sore:
But you'll forgive us, as you have before.
Back to the wilderness you go—but now
With an Immortal's laurels on your brow.
—*Mr. A. P. Herbert in "The Sunday Graphic."*

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

INDIA

Kathiawar Express to Run Again

The Bombay, Baroda & Central India Railway announces the reintroduction of the Kathiawar Express between Bombay and Virangam. This train was discontinued 3 years ago when war conditions compelled the company to curtail its services. In the announcement, it is also stated that shortage of coaching stock and coal makes it impossible at present to make a greater response to the public's demand for improved train services.

Jodhpur Railway Post-War Plans

The Jodhpur Railway proposes to spend Rs. 1,53,93,000 on post-war reconstruction. The programme includes general works (including Rs. 77,55,384 for track renewals) Rs. 84,58,000; staff quarters Rs. 16,99,000; regirdering bridges Rs. 60,000; construction of new lines (branches from Bilara to Jajtaran, 15½ miles, and Merta City to Riyan 14½ miles) Rs. 14,56,000; and rolling stock (including 17 new locomotives, and replacement of boilers, coaching and goods stock) Rs. 37,20,000. A Reconstruction Fund has been created to meet this programme.

Third Class Travel Improvements

The Indian Merchants' Chamber, Bombay, has suggested to the management of the Great Indian Peninsula State Railway that a new type of third class coach be designed, taking into consideration hygienic and sanitary requirements with special relation to the climatic conditions of India. Improved amenities are also suggested for third class passengers in the post-war period. Separate ticket-booking windows for women are recommended. High-level platforms, protected from sun and rain, covered footbridges and adequate sitting accommodation on platforms, washing and bathing facilities attached to waiting rooms at junction and terminal stations are other suggestions put forward by the Chamber. Further recommendations include better lighting arrangements in trains, the appointment of "train caretakers" and the provision of special sleeping cars for third class passengers on payment of a nominal supplementary charge.

SOUTH AFRICA

Assistant Health Officers

Railway Assistant Health Officers are to be appointed at Johannesburg, Cape Town, Durban, and Bloemfontein. These officers will be directly responsible to the management through the Railway Health Officer, and their duties cover the whole of the systems operated by the South African Railways and Harbours.

The health officers will be required to assist the railway Health Officer in exercising supervision over all health and welfare staff, and to co-ordinate these services with those of public bodies and of the State. They will also assist the railway Health Officer in his capacity as Medical Officer of Health for railway premises and will assist in organising and promoting health services, including anti-malaria and anti-plague campaigns, and immunisation measures against infectious and preventable diseases.

The officers will also help with social and welfare services for the Administration's staff and their dependants and with social rehabilitation work generally, especially among the families of men on active service and servants resuming duty after military service. The work will also cover the national health and fitness movement among servants and their dependants. The supervision of services for supplying meals at working places, of food supplies generally, and of social and health conditions in the Administration's hostels and communal canteens also will form part of the officers' duties.

Rolling Stock Manufacture

Private enterprise in the Union has been called on to help the South African Railways & Harbours Administration to supplement its stock of railway trucks. The manufacturing of these vehicles is in hand at the works of the main contractors, Dorman Long (Africa) Limited, at Germiston. This company is making the underframes and bodies and carrying out the entire assembly of the wagons. Production of various components is being done by sub-contracting firms.

Naming of Engines

It has been decided to adopt the practice in Great Britain and America of giving names to the engines used on main-line passenger trains. The engines of class "23" and class "15F" will bear the names of cities and towns in the Union of South Africa.

UNITED STATES

Birthday of the "Hiawatha"

On May 29 the tenth birthday of the "Hiawatha," one of the best known of American streamline trains, was celebrated in Chicago at a luncheon given by the Chicago, Milwaukee, St. Paul & Pacific Railroad to prominent Chicago business men and the press. Appropriately, the luncheon was served in a dining car, located on a track adjacent to that from which the "Afternoon Hiawatha" left at 1 p.m. for St. Paul and Minneapolis.

The original streamline train consisted of six vehicles, hauled by specially-designed Atlantic locomotives; in the next year it became necessary to increase the accommodation, and in 1939 the service had been doubled; today the "Hiawatha" runs twice daily in each direction with 15-coach formations—an increase which bears witness to the popularity in the U.S.A. of high-speed service. The present stock is the fourth development of that first built for the service.

Powerful 4-6-4 locomotives have replaced the original Atlantics, which have been transferred to the "Mid-West Hiawatha" between Chicago and Omaha; and the "Morning Hiawatha" workings in each direction have been taken over by twin-unit 4,000-b.h.p. diesel-electric locomotives. Two more of the last-mentioned are on order, and from their delivery in October next the whole of the "Hiawatha" runs will be turned over to diesel power. In the meantime, the "Hiawatha" represents the only steam-operated service in the world on which speeds up to 100 m.p.h. are needed daily to ensure timekeeping.

On the Chicago-Milwaukee stage of the westbound run, the locomotives are required to cover the 57·6 miles from Tower A20 to Lake, near Milwaukee, in 38 min., at a pass-to-pass average of 90·9 m.p.h., with a gross trailing load of between 750 and 800 tons. For the 412 miles between Chicago and St. Paul there is allowed 6½ hr., with 7 intermediate stops. In ten years, the "Hiawatha" has carried 3,951,766 fare-paying passengers, and has earned a gross revenue of $17,963,662. (*See also editorial note*).

New Steam Locomotives

The new "T1" class 4-4-4-4 non-articulated steam locomotives of the Pennsylvania Railroad, of which 50 are in course of construction, are exciting interest in other quarters in the United States. The New York Central System has just put on order one locomotive with this wheel arrangement, doubtless for comparative tests against engines of its own new 4-8-4 "Niagara" class; and the Texas & Pacific Railway is inquiring for two or three 4-4-4-4 locomotives.

SPAIN

Higher Locomotive Building Costs

The Spanish locomotive industry is aiming at an increase in the unit price of locomotives as it has been found that the present price of 9 pesetas for 1 kg. or 4s. for 2·2 lb., equivalent to £203 a ton, constitutes the barest minimum and does not allow, in many cases, for any profit. It is stated that this has resulted in a lowering of the quality of materials used, and in addition is hampering any further technical development.

DENMARK

New General Manager of the State Railways ?

The General Manager of the Danish state railways, Mr. P. Knutzen, has been given leave of absence while his behaviour during the war is being examined. The same applies to Mr. Hedegaard, Chief of the Advertising Department of the State Railways. Mr Knutzen's post is being held temporarily by the Traffic Manager, Mr. E. D. F. Terkelsen.

Improvement in Train Service

While it has been possible to maintain a passenger train service on Zealand, although on a very reduced scale and only every second day, it was necessary in Jutland to stop all passenger train running, because the Germans had taken control of the remaining stores of coal. Passengers had a chance of being carried by goods trains, if any space were available. Goods traffic had to be reduced, and many sorts of goods were not carried at all. Now that the coal stores are free again, passenger train running has been restored in Jutland but only every second day, as on Zealand.

CEYLON

Transport Board

Most of the proposals of the Director of Transport, Mr. S. W. Nelson, for the improvement of transport services in Ceylon after the war, have now been approved. There has been a modification of the Director's recommendation for the establishment of a Transport Board for all commercial transport. Under the original proposals the Board was to have extensive powers over railway rates, the operation by the railway of road collection and delivery services, and the provision or closing of stations. It was also proposed that the Board should deal with the development of the Island's inland waterways and coast wise shipping. The authorities agreed that such wide powers should not be given to the Board, but that it should function more as an advisory body.

Track and Roadbed for High-Speed Trains*

High speed with reliability, safety, and comfort, calls for further track improvements, and revision of maintenance practice

THE ideal running ground for high-speed trains would be straight level track, but generally this condition rarely exists for any lengthy distance, and, when gradients must be considered, high speeds with standard-weight equipment are costly to maintain. Grade adds 20 lb. for each one per cent. of grade to the resistance of each ton of train, and this is far in excess of the total of all other resistances. However, no matter what the profile may be, the roadbed and track must first be dependable, and the expense of preparing it for high-speed service must be considered before the equipment and motive power which will be used.

Track which enables trains to ride smoothly and comfortably at speeds of 50 m.p.h. may be neither smooth nor safe at 90 m.p.h. and as speeds approach 100 m.p.h. the severity of conditions increases. A slight irregularity in the line or the elevation on a curve, which would scarcely be noticed at ordinary speeds, may cause marked discomfort to passengers at speeds of 90 to 100 m.p.h.

Roadbed and track have been improved vastly during the past 15 years in many parts of the world, which accounts (at any rate in part) for the fact that, while speeds of 100 m.p.h. or more have been available for many years, so far as motive power was concerned, railways were unwilling to operate trains at such speeds because track conditions did not justify it. The streamlining, lighter equipment, etc., of today would be unavailing without safe tracks and roadbed over which to move them. Just as the modern highway has raised the speed limits of the motorcar, to the same degree has the modern railway track made possible the higher speeds of trains.

A better understanding of drainage problems; deeper ballast; treated sleepers of larger dimensions; heavier rail sections of improved design and composition; improved and more substantial rail fastenings; the rail flaw detector which discloses internal defects; more efficient methods of maintenance-of-way operations; greater refinement in track line and surface; the use of railcars for maintenance and supervisory forces; the widespread installation of labour-saving machinery and devices; have all combined to provide a track over which heavy trains may be operated safely and comfortably at high speeds.

The first opportunity to increase the strength of the tracks is in the use of heavier rail. At the end of 1933 the average weight of rail in the main-line tracks of the Class I railways of the United States was only 92 lb. per yard. On a mileage basis, 66 per cent. of all main-line track was laid with rail weighing less than 100 lb., and 42 per cent. of the total weighed less than 90 lb. Against this, only 26 per cent. of the total mileage was laid with rail weighing from 100 to 129 lb., and 7 per cent. with 130 to 139 lb. rail. In most modern designs of rail the stiffness increases as the weight increases, which makes stronger track.

The rail joint is the second important item in better track, since the continuity of the rail is broken at this point and few designs of joint fastenings approach the strength of the unbroken rail. Careful attention to proper design of joint fastenings insures strength and good riding conditions at the rail ends. Even with good joint fastenings, the maintenance forces must be alert constantly to keep the bolts tight and the joints properly surfaced. Furthermore, since smooth-riding joints are not possible unless the ends of the rail are at the same elevation as the running surface elsewhere, more attention must be given to building them up by welding as soon as the joint batter progresses to the point where it affects the riding qualities.

With flat-bottom rails, baseplates are absolutely necessary for high speeds, and they must be of proper area and section to insure maximum protection to the sleepers and to hold the track to gauge. Some engineers are of the opinion that stronger track is obtained through the use of a fastening which holds the rail to the baseplate without fastening it directly to the sleeper. Unless restrained, rail will creep under traffic. This results in poor line and surface and may create a dangerous condition. Comfortable riding at high speed is not possible if the line is poor. Therefore, when preparing and maintaining track for high speeds, the importance of ample anchorage against creepage cannot be overlooked.

Strong smooth-riding track is impossible with even the best of materials unless it rests on a stable foundation of sound sleepers, clean ballast of sufficient depth to support them effectively, and a stable well-drained roadbed.

Having discussed strength of the track and its foundation, let us consider its general layout. When schedules call for high average speeds, every minute counts and any reduction in speed means a loss of time that must be made up by speeds which are not only correspondingly higher than the average, but for a much greater distance. Thus, where schedules are shortened, the loss of time occasioned by reducing speed from perhaps 90 m.p.h. to 20 over a drawbridge, through a junction, or where a section gang is working a distance of possibly not more than 500 or 600 ft., may not be regained under 40 or 50 miles in many instances. Therefore, for high-speed services, obstructions to maximum speed must be minimised. To accomplish this, curves may be reduced or line revisions made to eliminate sharper curves, points rearranged, and maintenance forces required to do their work in such a way as to avoid interference with the passage of trains at full speed.

Probably curves are the most general obstacle to sustained maximum speeds. When a train traverses a curve, centrifugal forces come into play which tend to overturn the equipment about the outer rail. Whether the force is sufficient to do so or not depends upon the speed, the sharpness of the curve, the height of the centre of gravity of the equipment, the gauge of the track, and the elevation of the rail.

Electric and diesel-electric locomotives carry the motors either on the axles or close to them, which materially lowers the centre of gravity as compared with the steam locomotive, where the weight is in the boiler above the frames. Theoretically, and to some extent actually, this lower centre of gravity allows speeds around curves to be increased. On the other hand, there is a tendency for the steam locomotive to sway around the curve; with the low centre of gravity of electric or diesel stock, there is a tendency to push harder laterally against the outer rail and this throws the curve out of line.

The superelevation of the outer rail above the inner rail can be increased to permit higher speeds around curves, but this seldom exceeds 8 in. Where curves cannot be elevated to the full amount demanded by the speed, the speed must be reduced to that which may be operated safely at the elevation possible. Lack of uniformity in superelevation of rails on curves will create irregularity of motion in the cars which is likely to create a feeling of insecurity to the passengers.

In considering curves suitable for high speeds, it is important that the trains pass from straight track to the curve without abrupt change. This necessitates the use of long easement curves or spirals. A train will ride comfortably on a curve with less than the theoretical amount of elevation if the curve is properly transitional. To insure a smooth-riding transition from straight to curve, and from curve to straight, there must be a correct relation between the degree of curvature, the length of spiral, and the rate of transition from level track to the superelevation of the curve. Opinions differ as to the proper relations of these items, but concur that all curves of 30 minutes and sharper should be spiraled for high-speed trains. One American railway operating a high-speed service introduces elevation at the rate of 1 in. in 100 ft. for speeds over 85 m.p.h. The Maintenance of Way Association (U.S.A.) has suggested " That for speeds of 90 m.p.h. on a 1 degree curve, the spiral should be about 400 ft. long, with 3½ in. of superelevation."

Curves introduce another complication, since for any given curve every rate of speed requires a corresponding minimum superelevation to produce comfortable riding, and it requires only a small increase over this minimum to cause discomfort. Yet, as the rate of curvature increases, this minimum for each speed increases directly with the degree of curve and as the square of the speed in m.p.h. It is obvious, therefore, that where the curvature is much above 2° it becomes necessary to limit the speed around the curves to avoid introducing so much superelevation that it will interfere with slower trains. Also, more work is required in the maintenance of curves than of straight track, as the centrifugal force of trains passing around the curves tends to force the weaker parts out of the true, resulting in bad riding conditions.

Finally, in the preparation of track for high-speed service, a new conception of maintenance must be instilled into the track gangs. The effect of small irregularities in line and surface is magnified as the speed increases, and it is therefore essential that the track be brought to a high degree of perfection before high-speed operation is undertaken, and that this refinement be maintained from day to day. High speeds increase the wear and tear on the track and hasten the development of irregularities that require still more maintenance, so prompt attention must be given to small defects to prevent their growing quickly into larger ones. Of course, any reduction in weight of equipment, which usually accompanies higher speeds, will be of advantage to the track.

(*Continued on page* 115)

* An abstract of the relevant section in the volume "The Steam Locomotive: Its Theory, Operation and Economics; including Comparisons with Diesel-Electric Locomotives" (second edition), by Ralph P. Johnson, M.E., Chief Engineer, The Baldwin Locomotive Works. This was reviewed in our issue of August 18, 1944, page 155

Modern Bridging Practice in New Zealand

Reinforced concrete is now standard for arches of all kinds and trestle viaducts on the Government Railways

IN the past the New Zealand Government Railways have specialised rather in steel trestle and girder viaducts over the many ravines crossed by this 3 ft. 6 in. gauge system. Prior to the war, however, the practice was to substitute reinforced concrete for steel in the trestles, and, with the wartime shortage of steel, practically all new bridges in the Dominion are now entirely of reinforced concrete. In the last seven years over 40 such bridges have been built, all designed for Cooper's E 40 loading and to British Standard Specification for girder bridges and also to the American Railroad Engineering Association Specifications for materials and stresses. An 8-in. trough deck carried on two r.c. girders and cast integrally with them is standard design, the track being retained in the trough and a continuous platform or gangway being provided for ballast during maintenance work.

Apart from the necessity of economising in the use of steel, low maintenance costs and freedom from corrosion have weighed heavily in favour of all-concrete bridges, especially as most of them have been required by or near the sea coasts of one or other island. They are, in fact, situated on : (*a*) the Waikokopu-Gisborne section of the east coast trunk line in North Island ; (*b*) the Ward-Parnassus section of the South Island main trunk line ; and (*b*) a section of the Westport-Inangahua line in Nelson Province, South Island.

Though these bridges are of a number of different types, they are all designed to A.R.E.A. specifications for concrete structures, and to withstand centrifugal force, earthquake shocks, acceleration and braking, as well as the usual dead, live loads and wind pressure. Though a 1 ft. 2 in. depth of ballast below top of sleeper is specified, no allowance is made for distribution of load longitudinally, as the A.R.E.A. specification considers no such distribution with less than 3 ft. depth of ballast. The maximum length for simply-supported girder spans has been arbitrarily fixed at 45 ft. Where necessary the effects of centrifugal force were computed ; cant is provided for in the depth of ballast. Earthquake forces on each unloaded structure are calculated for a horizontal acceleration of 0·10 g., and each bridge is specially designed to suit the site and local conditions. No bearings or articulations are included in the various designs except Mesnager hinges, so that braking and traction forces are transferred from span to span to the abutments or to special traction piers. Particular care was taken in the tying of every bar in every column at intervals within the slenderness ratios of the rods, to combat plastic flow in the concrete. The tendency in design, especially in the arches, is to reduce the ratio of live to dead load stresses by increasing the latter, and in the design of girders tensile stresses were limited.

The fixing of 45 ft. as the maximum length of simply-supported girder span had the advantage that erection was simple even at great heights, because rolled steel joists could be used as falsework between the piers ; the maximum available length of reinforcement rods was 52 ft., so that longer spans would have required lapping or welding, for which facilities were not available.

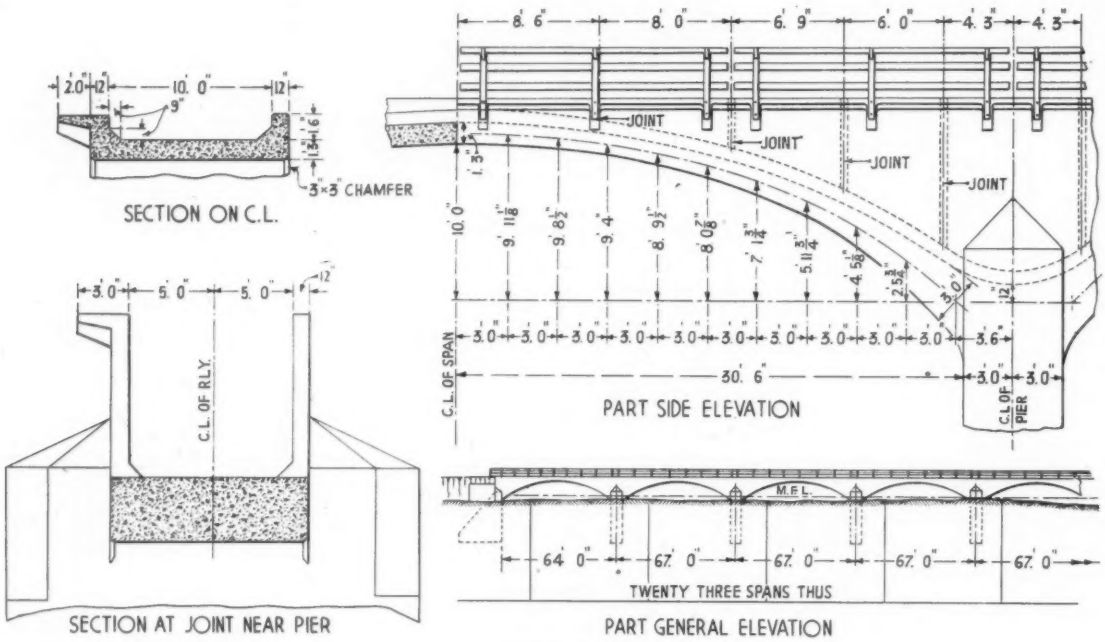
The following are typical examples of the various types :—

(1) Aniseed Creek bridge (on the South Island main trunk line) is a low-level continuous girder structure, consisting of 20-ft. 55-ft. and 20-ft. spans with counterweighted abutments. Limited headroom made an arch structure impossible. Rock foundation was available.

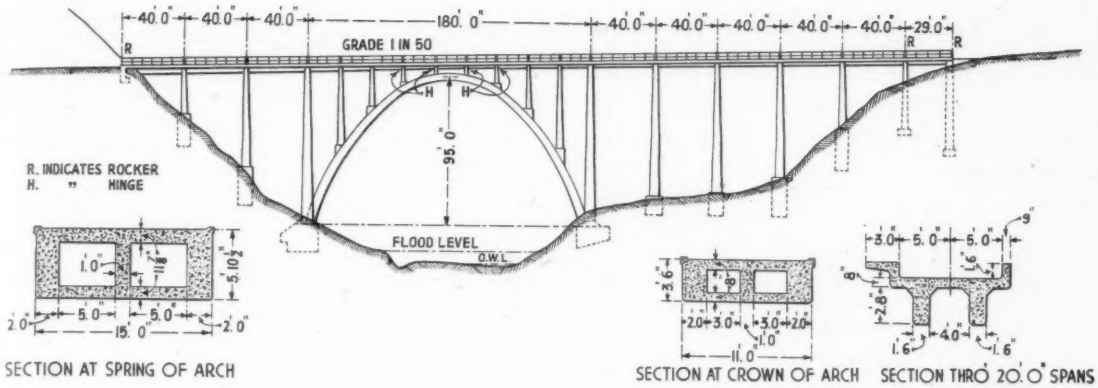
(2) Hapuku River bridge is a fine arch viaduct across a large and steeply-sloping shingle "fan." It consists of 23 67-ft. spandrel-filled arch spans on solid piers with massive cutwaters founded on conglomerate. Open-trench construction was possible with pumping from a sump. The r.c. spandrel walls, retaining the shingle filling, are broken by open joints at several points along each span, so as not to function in resisting live-load bending moments.

(3) Kahautara Stream bridge is a typical continuous girder structure on pile foundations and low piers. Its total length is 750 ft., made up of six groups of three-span continuous girders 40-ft., 45-ft. and 40-ft. in length and built monolithically with their piers ; 16-in. precast octagonal r.c. piles were used. This three-span grouping has also been used for several other bridges, and was found suitable for resistance to stresses set up by temperature variations. The piers are sufficiently stiff to resist traction and braking forces.

(4) The most numerous type, however, is the high-level trestle and girder structure, used with modifications in detail, arrangement, and size for such bridges as those spanning Stable Creek, Newman Creek, Okarahia Stream, Waiau Stream (32 mile 1 ch. crossing) and the approach spans in the larger structure over the same stream at 30 mile 15 ch. The trestles, except in the traction piers, are all single-bents of reinforced concrete, and they carry simply-supported girder-cum-decking spans, usually 40 ft. in length. The traction pier has a 20-ft. span over it, and is preferably sited at or near the centre of each bridge. One exception is Okarahia Stream bridge (one 35-ft., seven 43-ft., and one 40-ft. span), where pile foundations would have complicated the construction of a traction pier. The whole structure was, however, able to



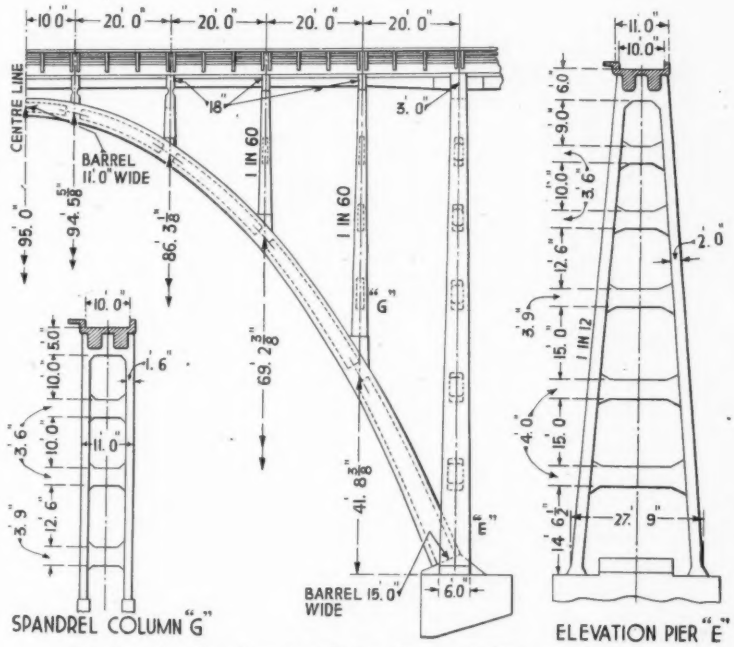
Hapuku River viaduct



General elevation and details of arch and girder spans, Waiau Stream bridge at 30 *m.* 15 *c.*

be anchored to one abutment founded in solid rock, which outcrops at that point. Mesnager hinges were used at the abutment and pier nearest to it, to permit of lateral movement taking place without restraint ; all the other (single-bent) trestle piers are sufficiently flexible to deflect with temperature deformations without excessive stresses being set up.

(5) Redmond Creek and Waiau Stream (30 mile 15 ch.) bridges have arch main spans and simple girder approach spans. The former consists of an 85-ft. two-rib arch without cross bracing flanked by 40-ft. girder spans. The major Waiau bridge is the most ambitious of all those now being dealt with. Its main span is a parabolic arch 180 ft. in span and having a 95-ft. rise ; the deck is 128 ft. above normal water level. It is a fixed arch supporting spandrel columns spaced 20 ft. apart centre to centre, which carry a superstructure continuous with the approach spans from abutment to abutment, a distance of 530 ft. ; at each abutment, at one of the shortest piers, and at the four shortest spandrel columns, Mesnager hinge rockers are provided. Wind pressure and earthquake forces on the superstructure of the arch are resisted by the deck system acting as a horizontal girder and are transferred thence through the trestle bents at the springings. The arch rib suitably resists all traction forces, transmitting them to the foundations which are on sandstone. The arch consists of a single tapering rib, varying in width from 15 ft. at the springings to 11 ft. at the crown and hollow in section except immediately beneath each spandrel column, which is an 11-ft.-wide parallel-sided trestle. The



Further details of arch, Waiau Stream bridge at 30 *m.* 15 *c.*

trestle bents over the springings taper from 11-ft. width at the top to 27 ft. 9 in. at the springings.

We are indebted to our contemporary *Concrete* for most of the information and for the drawings reproduced, and understand that both were originally supplied by the courtesy of Mr. W. L. Newnham, Engineer-in-Chief, New Zealand Public Works Department.

Track and Roadbed for High-Speed Trains—(*Concluded from page* 113)

The care of high-speed track throws a heavy responsibility on the maintenance-of-way forces, and requires careful organisation, supervision, and equipment.

Although high-speed trains fix the standards to which tracks must be maintained, they constitute only a small portion of the total traffic. By far the largest percentage of train mileage is of freight trains, and, even among passenger trains, a considerable proportion is local, where high speed is of limited value.

Also, many trains operate on a schedule where high speeds would be of little advantage, such as night passenger runs between large cities 100 to 400 miles apart where the runs can be made readily in the seven or eight hours normally desired for sleep.

RAILWAY ELECTRIFICATION IN SWITZERLAND.—Electric traction was introduced on July 8 on the 11-mile standard-gauge line Langenthal-Huttwil of the Vereinigte Huttwil-Bahnen. Langenthal is about halfway between Berne and Olten. This is the first section of the 58½-mile standard-gauge system of the company to be electrified. Conversion work on the other lines (Ramsei-Sumiswald-Huttwil, Sumiswald-Wasen, Huttwil-Wolhusen, and Huttwil-Eriswil) is in hand. The electrification of the Langenthal-Huttwil line allowed the number of week-day trains to be increased from 8 to 11 a day in each direction. The cost of electrification of the whole of the Vereinigte Huttwil-Bahnen is estimated at Fr. 12,300,000 (£709,000) of which the electrical work will absorb Fr. 9,500,000 (£548,000), with the balance to be allocated to the reinforcement and renewal of track.

ASSISTANT HEALTH OFFICERS FOR SOUTH AFRICAN RAILWAYS.—Assistant Railway Health Officers are to be appointed by the South African Railways & Harbours Administration at Johannesburg, Cape Town, Durban and Bloemfontein. They will be directly responsible to the management through the Railway Health Officer.

Gauge Unification in Australia

Report by Sir Harold Clapp, K.B.E.

ON more than one occasion recently we have referred to the proposals to unify the track gauge of the individual State railway systems in Australia to the standard of 4 ft. 8½ in., and have pointed out that the matter has become one of urgency by reason of the experience gained during the war. It is recognised in Australia that unification is primarily a national undertaking, and that its justification must depend mainly on defence grounds rather than on economic grounds. Nevertheless, although the proposals have been framed after due consultation with the army authorities, economic and developmental aspects have also been surveyed closely. The Commonwealth Government in March, 1944, deputed Sir Harold Clapp to investigate and report on the unification of gauge, and his report was submitted recently to the Commonwealth Authorities.

Extent of Conversion

He has recommended the conversion of the broad-gauge railways in Victoria and South Australia, but not the 3-ft. 6-in. gauge lines in Queensland and Western Australia, nor the system of similar narrow-gauge in Tasmania. Also, the isolated group of 3-ft. 6-in. gauge lines in South Australia, based on Pt. Lincoln, as well as the Commonwealth line from Port Augusta to Alice Springs, are to be left alone at this stage, and the extension of the railway northwards from Alice Springs "deferred indefinitely."

In Western Australia the needs of the main standard-gauge railway structure would be met, according to Sir Harold Clapp, by the provision of an independent 419-mile standard-gauge connection between Freemantle, Perth, and Kalgoorlie, linking at the last-named point with the Commonwealth Trans-Australia Railway. This is estimated to take four years to build, and to cost £7,512,000 for the line and £840,000 for locomotives and rolling stock.

In South Australia, a similar standard-gauge link (but by conversion of the existing 3-ft. 6-in. gauge line) would be provided between Port Pirie and Broken Hill, where connection is made with the New South Wales Government Railways. This would involve the acquisition by the Commonwealth (by arrangement with the State of New South Wales) of the Silverton Tramway Company's 3-ft. 6-in. gauge line between Cockburn and Broken Hill, 36 miles, and its conversion to standard gauge. The cost of acquisition alone is given as £1,076,000.

A New Trunk Railway

In the North-East, the recommendations comprise establishing a through standard-gauge railway from Bourke to Darwin by the construction of lengthy new sections of 4-ft. 8½-in. gauge railway; by the introduction of a third rail on the 110-mile Longreach-Winton section of the Queensland Government Railways; by the conversion from 3 ft. 6 in. to 4 ft. 8½ in. of the Townsville—Dajarra section of the Q.G.R. and its branches, in all 901 miles; and by the conversion of the Commonwealth Railway from Birdum to Darwin. Queensland and the Northern Territory would be connected by a long new 645-mile standard-gauge line across the Barkly Tableland, extending from Dajarra to Birdum. The time for completing all these works is estimated at eight years.

Stages of Conversion

The work of standardisation falls within two periods. First, the initial, or preparatory period (estimated in the case of Victoria at four years) during which suitable preliminary works are undertaken, including assembling material and equipment, the construction of new lines, alterations to workshops, locomotive and other depots, goods and livestock transfer yards, new rolling stock and locomotives, conversion of portion of the existing rolling stock, and preparing tracks and structures for actual conversion. Secondly, the conversion period (estimated at three years in the case of Victoria) which begins with the actual conversion of tracks, structures, and existing locomotives and rolling stock. Sir Harold approves of the intended programme of sectional conversions in Victoria which we described in some detail in *The Railway Gazette* of April 13 last, page 366.

The conversion of locomotives and rolling stock in general will be achieved by the substitution of standard-gauge axles and bogies for their existing counterparts. A suitable number of axles and bogies will need to be manufactured beforehand. These works, as well as the construction of many new locomotives, carriages, vans, and goods vehicles, will involve the construction of special workshops for the purpose, and the programme will be of such magnitude as to require the assistance of outside engineering establishments, generally in the manufacture of component parts.

Associated Improvement Works

Sir Harold states that "to be fully effective in the national sense, unification of gauges must be accompanied by unification of railway thinking and planning, standardisation of equipment, and introduction of modern methods of operation to the greatest extent practicable, with the object of securing maximum efficiency and service. In my opinion, standardisation without modernisation could not be justified." The point is made that, in view of the huge amount of betterment and maintenance work that has had to be deferred during the war years, the greatest opportunity in history will be afforded the railway authorities for modernising their systems.

It is stated that the Australian railways are operating many different types of passenger cars and brake vans, a great number of types of freight wagons, and more than 100 different types of locomotives, which vary widely in design and operating efficiency even when intended for similar service. It is contended that standardisation would vastly simplify and cheapen design, tooling, and production, reduce the holdings of spare parts, and lead to considerable economies in maintenance costs. Central engineering designing and laboratory staffs are suggested.

Many aspects of railway policy are involved in the references to modernisation, and a summary of Sir Harold Clapp's comments, under various headings, is given hereunder.

The enormous advances in engineering science and production under the stimulus of the present war have opened up a most promising field for the use of new materials to give better or more efficient service. These should be exploited to the full if the railways are to reap the maximum advantages. Constant research and experiment costing millions of pounds on improvements to bridges, signals, locomotives, rolling stock, etc., are continuously taking place in the railway systems of Great Britain and the United States of America. The best results, however, demand that equipment and operating procedures be standardised, and more important still that their effective use be not curtailed by the arbitrary limits imposed by existing State boundaries.

Train Speeds

Developments in air, sea, and road transport indicate clearly that if the railways are to hold their place in the post-war world, it is imperative that both passenger and freight train speeds be increased, particularly on Interstate and long Intra-State routes. Present scedules of the fastest Interstate passenger services, viewed by modern standards, are regarded by Sir Harold as suitable only for fast freight trains. Standardisation will undoubtedly facilitate the establishment of faster through schedules for both passenger and freight services between the respective capital cities, and between such cities and their important country centres.

Travel Comfort

All inter-capital and long-distance Intra-State trains should be air-conditioned to prevent the entry of smoke, dust, and grit, and to ensure quietness, adequate ventilation, and cleanliness; and up-to-date buffet car service should be provided. Carriage interiors should also be made attractive by the use of special lightweight materials, comfortable seating, streamline interior design, and modern shadowless lighting.

Electrification and Signalling

Greater use should be made of electric traction on dense traffic routes, and modern power signalling and installations and power-operated points should be provided.

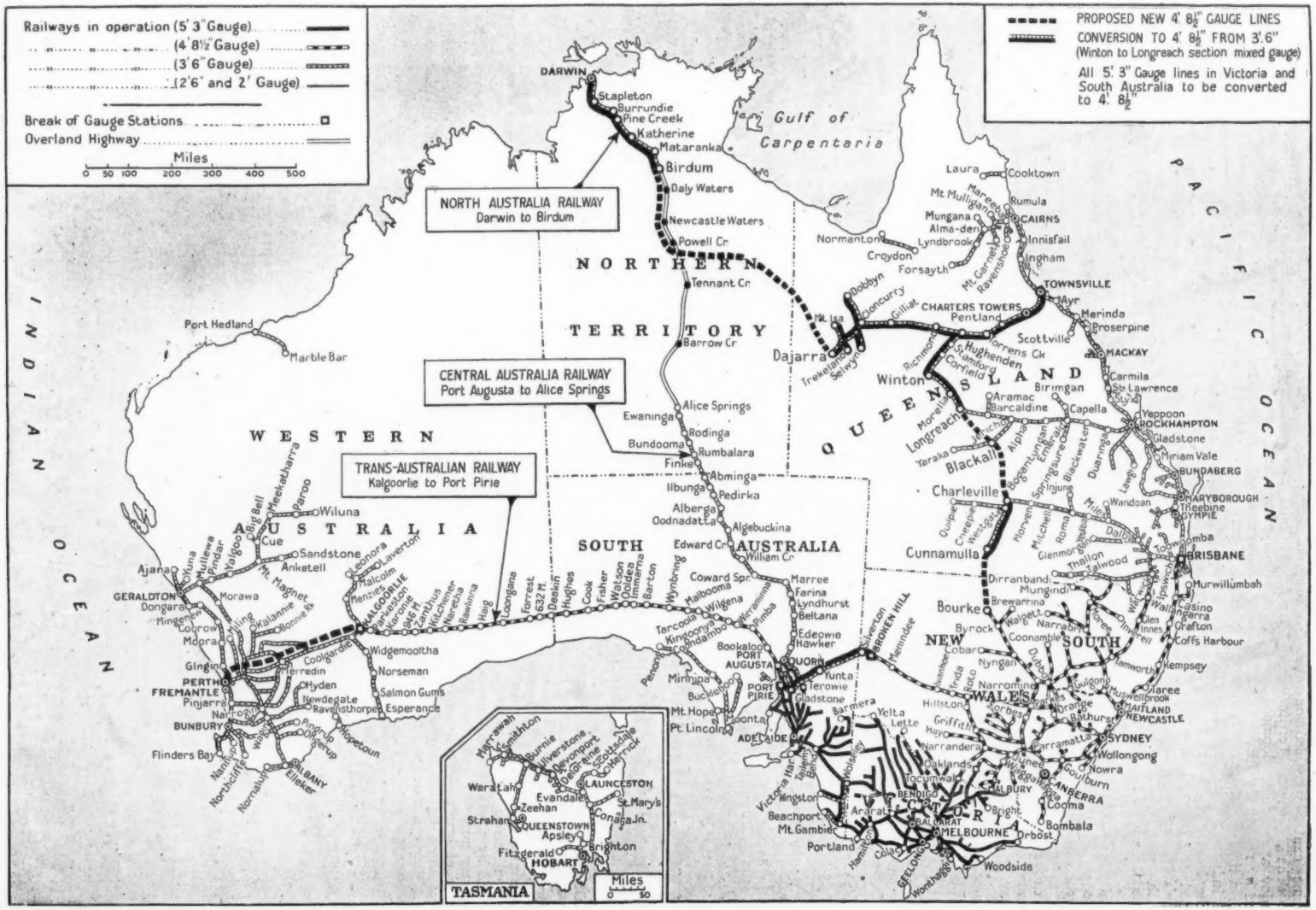
Diesel-Electric Traction

The diesel-electric locomotive, which has many advantages, has proved itself a successful rival of the steam locomotive in several phases of railway operation, and has also become a strong competitor with electrification development of main lines. Such locomotives could be operated with great advantage on some Australian lines, such as the Trans-Continental Railway and the proposed Darwin—Queensland line, as the haulage of coal and water would be unnecessary. In the case of the Trans-Continental line, water-treatment plants could be eliminated. Diesel-electric shunting engines have abundantly demonstrated their suitability for busy shunting yards and passenger terminals, where they can be worked for approximately 72 hours without refuelling, and their almost continuous availability enables four diesels to do the work of seven steam locomotives. Complete elimination of the smoke nuisance is an important advantage.

Development Value of Northern Scheme

The view is expressed that the proposed standard-gauge lines to connect the Northern Territory with the Eastern portion of Australia "should have been car-

Australian Gauge Conversion Proposals



In addition to the conversion to 4 ft. 8½ in. of the gauge of the important 5-ft. 3-in. group of lines in Victoria and South Australia, Sir Harold Clapp has recommended conversions and new construction to complete standard-gauge east-west and north-south strategic routes as shown above

ried out years ago in the national interests." The defence aspect is, of course, paramount, but Sir Harold unequivocally expresses the opinion that this portion of the scheme can be justified on other grounds. The Northern Territory will never enjoy any real development unless connected by rail with the Eastern States, and such a line would greatly benefit the pastoral industry. The logical route is across the Barkly Tableland, which has an assured and plentiful rainfall as well as bore water, and large areas of which, along with other portions of the Northern Territory, can be converted to sheep raising.

The railway would enable cattle for meat production to be disposed of at least a year earlier than is generally now possible, saving time, labour, and the cost of droving and agistment. The beasts must now be held till a more mature age to fit them for a long journey on the hoof of upwards of 1,000 miles, during which they lose so much condition that they have to be retained for lengthy periods in the fattening areas before they are suitable for marketing. Queensland would gain increased business from the link between the Northern Territory and Townsville, which would bring fat stock direct to the meat works on the Queensland coast.

The route suggested for the Queensland section of the line traverses better country, and would lead to much greater development than the more westerly route proposed in earlier years. The construction of the Charleville—Blackall line would give Queensland and the Commonwealth a strategic defence line, a pastoral railway, insurance against drought, substantially closer settlement, not only in the area served, but also in adjoining areas, additional permanent and temporary employment, and greater security with improved social conditions in the far Central West.

The East-to-West Route

Another economic factor in the standardisation of gauges is the conversion of the Port Pirie to Broken Hill line, which would " shorten the distance " between Perth and Sydney by 256 miles. This would not only confer advantages in defence transport, but, in case of emergency, would enable much of the iron ore now sent by sea from Whyalla to be overlanded from Port Pirie district to Newcastle. Coal and coke could be sent in the reverse direction without break of bulk from New South Wales to Adelaide and to Port Pirie with a short sea route to Whyalla by boat. In the present war the existence of this link, with reinforcements of rolling stock from New South Wales, would have been invaluable for movements of troops and military supplies and would have made the position of troops in Western Australia less precarious.

Standard Gauge and the National Outlook

The report states that it was the experience of Great Britain and the United States of America that diversity of railway gauges retarded national development, and that the advent of a unified gauge initiated an era of increasing co-operation and a broader national outlook which rapidly broke down the artificial barriers between communities.

Through Rating

Associated with the scheme is the question of modifying the freight rates at State boundaries which today exist as artificial barriers impeding the flow of goods to their natural markets or ports. Freight rates on the individual State railway systems of Australia are normally based on what is known as the tapering system, which provides for a lower rate per ton per mile the farther the goods are hauled. In the case of inter-system traffic, the tapering rate stops on the border of the originating State, and for possibly a short haul in the adjoining State a much higher rate applies. The report advocates a system of through rating, whereby the tapering rate will operate across the borders of the State to the ultimate destination of a consignment. With standardisation of gauges there will be less reluctance to move Interstate goods traffic by rail, as the handling at border stations will be eliminated.

In the concluding portion of the report, Sir Harold states that " From any serious study of this subject two paramount facts emerge: first, that for the safety and well-being of this great country, standardisation of railway gauges will have to be undertaken ultimately (that has been demonstrated only too clearly by the world war); and secondly, that the longer it is deferred the more costly it becomes."

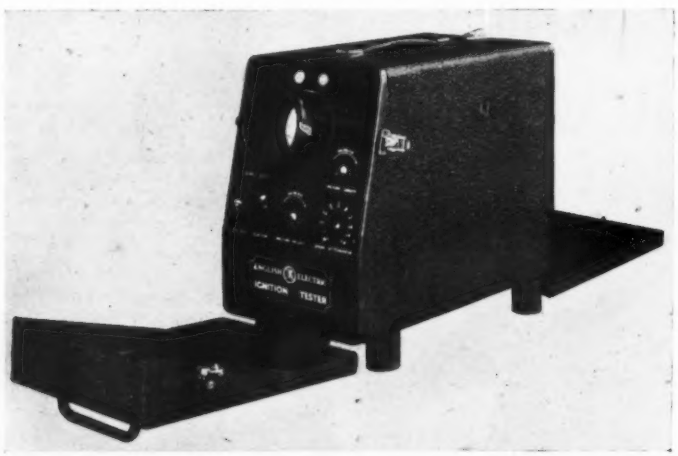
An Ignition-Testing Instrument

Locating petrol engine ignition troubles, while running, with the English Electric ignition tester

IGNITION testers have played an important part in wartime for locating faults in army tanks and vehicles. The use of such testers may prove of great advantage also in the maintenance of large fleets of petrol-driven lorries and vans such as those owned by the railway companies for goods delivery purposes.

The type of ignition-testing instrument illustrated, made by the English Electric Co. Ltd., displays the ignition performance of the engine pictorially on a screen while the engine is running. No access to the engine is needed, if a socket be provided for the connection, and the ignition is not affected by the instrument. The picture consists of a row of peaked figures, one for each sparking plug, arranged in the firing order of the engine, starting from a selected cylinder. Perfect ignition gives a steady row of identical figures, but any fault anywhere in the ignition system alters the shape of the figures. A faulty plug affects the corresponding figure, and can be identified from its position in the row; a defect in the magneto or the distributor alters the shape of the whole row of figures. Intermittent defects cause the figures affected to flicker in step with the defect.

No experience is necessary to locate a faulty plug, and the diagnosis of the kind of defect is greatly aided by the fact that the shape of the figure is suggestive of the defect itself. For example, an excessive spark gap gives a tall figure and a short-circuit gap gives a short figure. An occasional miss, which is a common trouble, gives a corresponding flickering of the figure. Among more complicated faults, a weak rocker spring, which causes the contacts to bounce above a certain speed, makes the row of figures " dance " as the engine is speeded up. Mal-adjustments and weaknesses which may not be causing trouble at the moment, are also shown up; in fact an experienced operator can gauge the condition of all parts of the ignition system better by applying the instrument than he would be able to by dismantling each part separately and examining it. The instrument illustrated is about the same dimensions as a portable typewriter, and is arranged to take its power supply from 220-volt A.C. mains, or from a six-twelve- or twenty-four-volt accumulator.



The English Electric ignition-testing instrument with covers open ready for use

KIEV UNDERGROUND RAILWAY.—Kiev, the capital of the Soviet Ukraine, has begun construction on the first 6 miles of its planned underground railway, according to Soviet news agency report. Work is under the supervision of veteran engineers from Moscow. Well-known artists, architects, and sculptors are engaged on plans for the stations and vestibules.

The Hellenic State Railways in War

Work during the Albanian Campaign of 1940-41, and the German occupation of 1941-44; and damage and demolition by the retreating Germans

By B. Leondopoulos, Acting General Manager, Hellenic State Railways

WHEN Italy attacked Greece on October 28, 1940, the Hellenic State Railways were responsible for the transport of a great part of the Greek Army during the first month of mobilisation to the north and north-western parts of Macedonia. During the Albanian Campaign the line from Salonika to Florina worked at full capacity for the transport of munitions and other materials necessary to the fighting forces.

On April 6, 1941, when the German and Bulgarian Armies attacked the Greek Forces, orders for a general retreat were issued after serious fighting, and at the same time the British Forces co-operating with the Greeks were obliged to undertake demolitions absolutely necessary to prevent a follow up by the German Army. The principal bridges partly blown by the British R.Es. were the Axios, Aliakmon, Bralo, and Pinios bridges, and a few others of minor importance. On April 20, 1941, a German flying squadron bombarded the railway line from Larissa to Sfendali, inflicting great damage to the permanent way, rolling stock, telegraph lines, etc., and rendering the line practically useless for some time.

Greece was occupied by the Germans on April 27, 1941, and the German Army took over the Hellenic State Railways. Within six months railway communication was established from Piraeus to the Greco-Jugoslav frontier. During the occupation the Germans increased the length of all sidings up to 550 metres, to allow the standard German military trains to arrive at Piraeus straight from Germany without having to be split into two sections. All water supply installations were improved, and some new ones built. New locomotive sheds were built and existing ones improved. Machine tools were brought for increasing the capacity of the workshops. A new German signalling system was introduced, and telephone and telegraph installations were improved.

In a word, the line from Idomeni (on the Greco-Jugoslav frontier) to Piraeus harbour was brought by spring of 1942 to such a level as to allow 16 German Army standard trains to reach Piraeus (St. John's marshalling yard) daily. The number of Greek personnel was increased from 8,306 in 1940 to 21,000-22,000 in 1943.

The Germans began taking away rolling stock and materials during summer of 1944, and later they dismantled and sent to Germany all the machine tools they had brought to Greece, as well as the best ones belonging to the Hellenic State Railways.

On October 12, 1944, a special destruction train, as it was called by the Germans, composed of armoured cars, and a pioneer battalion, began demolition work from Piraeus Harbour to the frontier. The accompanying tables give an idea of the demolition effected, and the rolling stock taken away from Greece or destroyed. The very heavy demolitions were carried out intensively with the object of putting the railway system of Greece out of action for some years.

Immediately after the landing of the British Forces in October, 1944, they co-operated with the competent Greek officials in visiting almost the whole of the Hellenic State Railways system and arranging a programme for the reconstruction of the less damaged sections. If the necessary bridge material and rolling stock is delivered in time, it is hoped that by end of next September the following sections will be open to traffic :—

(1) Piraeus-Velitza with Chalkis branch.
(2) Salonika-Alexandroupolis-Pithion.

The Rodopolis-Alexandroupolis-Pithion line suffered no damage, being under Bulgarian control.

The foregoing constitutes stage one of the priority programme of reconstruction. Stage two consists of the further sections from Velitza onward to Delphi, and from Salonika southward to Kolindros. Stage three comprises the lengthy sections from Lianokladi to Kolindros, and from Platy to Edessa. The fourth stage includes the remaining section of the north-south main line between Delphi and Llanokladi (which was subjected to particularly heavy damage), and from the junction outside Salonika to the frontier of Jugoslavia at Idomeni.

The following new railway lines were built or finished during the war :—

(1) A line from Myrini-Amphipolis, built by the Hellenic State Railways, was opened to traffic by May, 1940.

(2) A line from Siderocastro to Kulata (on the Bulgarian frontier), 20 km. long, was built by the Bulgarians in 1942-44.

On April 18, 1945, the line from Alexandroupolis to Pithion, belonging to the Société des Chemins de fer Franco-Helleniques (C.F.H.), was taken over by the Hellenic Government and handed to the Hellenic State Railways.

The route length of the Hellenic State Railways is at present 1,263 km. (785 miles), plus 74 km. (46 miles) of newly-built line, and 185 km. (115 miles) of the former C.F.H., a total of 1,522 km. (946 miles).

(*See editorial note, page* 106, *and map and illustration, pages* 120-1).

DAMAGE BY THE GERMAN ARMY DURING ITS EVACUATION OF GREECE

Description of damage	Piraeus to Platy	Salonika to Kremenitza	Salonika to Idomeni	Salonika to Rodopolis
Length of complete track destroyed	10 km.	3 km.	7 km.	1·5 km.
Bridges and culverts destroyed	51	39	80	129
Tunnels blocked	6	5	—	—
Stations completely destroyed, including all facilities and tracks	6	4	4	—
Stations and yards partly destroyed, points and crossings blown up	23	—	—	—
Station buildings destroyed	10	3	—	1
Main workshops destroyed	1	1	1	—
Running sheds destroyed	6	4	1	1
Water supply installations demolished	16	4	4	6
Turntables and traversers destroyed	3	—	2	1
Length of track in which rails have been blown in centres	80 km.	32 km.	40 km.	40 km.
Points and crossings blown	350 sets	25 sets	117 sets	57 sets

PRESENT CONDITION OF ROLLING STOCK

	In service	Seriously damaged	Completely destroyed	Removed from Greece	Total
Locomotives	31	120	5	64	220
Passenger coaches	24	6	—	318	348
Goods wagons	173	305	25	4,053	4,556
Postal vans	11	—	—	89	100
Diesel cars	—	—	2	—	2

American Operating Methods in India

Frequent reference has been in the lay press to the heavy tonnage of military supplies now being moved over the metre-gauge section of the Bengal & Assam Railway by the American railway operating troops. From the experiences recorded in the *North Western Railway Magazine* by "R.O.C.," however, it is evident that these results are being obtained by distinctly unorthodox methods. He recounts that at a conference between officers of the B. & A.R. and of the then No. 1 of all the U.S.A. operating battalions, the latter remarked, when the question of signalling arrangements of new crossing stations arose : "We don't need signals, all we need is a stick with a flag on it and one of our boys to wave it."

Later "R.O.C." remarks : "I was held up for 24 hr. by a "wreck." caused by the head-on collision of two freight trains, one of them double-headed. . . . Either in the crash or in pushing the wreckage over the embankment, the pipeline was broken, and a 4-in. jet of aviation spirit gushed out for an hour.

"The running of 80- to 120-car trains has resulted in some breakaways resulting from broken couplings . . . and the high speeds have rendered pile-ups spectacular.

"To clear wrecks, the 'wrecker' (relief crane) is accompanied by bulldozers, which are used to roll derailed stock over the embankment, where it lies in rusty, mangled heaps, wheels in air, until the jungle envelops it. There have been ruins of two or three pile-ups in a single block section, so that the impression is given of repeated heavy air raids. But the stuff gets through to the front in impressive quantities."

Elsewhere, "R.O.C." says : "On another occasion while walking through a marshalling yard, I noticed that a wagon was fouling a rake which was being pulled out for sorting. Every door collided, slammed shut, rebounded, struck again, and slammed back. As soon as the din permitted, I called out to an American pointsman, who was sitting on the tumbler lever, "This wagon's fouling, it needs moving back a bit." Came the reply "That car will do fine where it is."

HIGHER RAIL UNLOADINGS AT U.S. PORTS.—Railway wagon unloadings of export and coastal freight at United States ports during June were 28 per cent., higher than in the corresponding period of 1944, reports the Association of American Railroads.

The Railways of Greece

All the standard-gauge railways in Greece are now in the hands of the Hellenic State Railways. The narrow-gauge lines are owned by three companies: the principal is the Piræus, Athens & Peloponnesus Railway, 506 miles south of Athens; the Thessalian Railway, 145 miles based on Volos; and the North-Western Railway, 46 miles around Etolikon

German Wrecking of Hellenic State Railways

(See article on page 119)

XUM

companies: the principal is the Piræus, Athens & Peloponnesus Railway, 506 miles south of Athens; the Thessalian Railway, 145 miles based on Volos; and the North-Western Railway, 46 miles around Etolikon

German Wrecking of Hellenic State Railways

(See article on page 119)

The remains of the Papadia Viaduct on the Piræus-Salonika main line

Wrecked water tower and other installations at Lianokladi Station

The remains of the famous Gorgopotamos Viaduct, a familiar pre-war feature of the Simplon-Orient Express route

(*Illustrations of the Papadia and Gorgopotamos Viaducts were reproduced in "The Railway Gazette" of March 4, 1932, page 337*)

Modernising London's Underground Signals

The original electro-pneumatic tunnel signals on the L.P.T.B. lines are being replaced by light signals of modern design

IT has been the practice of the London Passenger Transport Board steadily to replace its signal equipment as it became worn or out of date. During the war, however, this work has had to be curtailed considerably, although, at times, replacements become necessary.

An example of replacement, in lieu of extensive overhaul, is afforded by the electro-pneumatic spectacle type signals shown in the accompanying illustration. These signals were installed when automatic signalling was adopted for the electrified District Railway and for the tube lines associated with it; the Bakerloo, Piccadilly and Hampstead, or London Electric Railway, routes. The design of signal used in the District tunnels, where space restrictions were not so severe, was slightly different from that shown in the illustration, but the principles of working were the same. The spectacle frame containing the coloured glasses, red or yellow in the upper, and green in the lower opening, is moved to the clear position by an air cylinder and falls to the "on" position by gravity when air pressure is released. A lamp, originally burning oil, is carried behind the frame, which has a back-light attachment and connection to a circuit controller. The moving parts of this signal have proved an objectionable feature, involving appreciable maintenance, and soon after the original installation had been completed a lamp-type of signal, having two compartments with red and green lenses and a relay for operating the circuit, was introduced, so that no further electro-pneumatic signals were installed. The Metropolitan line, which adopted all-electric signalling, had signals of this kind, which were first seen in London on the opening of what is now the Northern City section, then an independent concern.

The original electro-pneumatic tunnel signals continued to work and give satisfactory service, but the maintenance necessary to keep them working after 30 years' life became unreasonably great. Accordingly they have been replaced gradually by the more up-to-date lamp signals. Approximately 200 such signals are still in use, of which half will be scrapped during the present year, and it is anticipated that by the end of 1946 none will remain. The modern type of tunnel signal, with controlling relay in a case, wiring, and "A" sign for indicating when the signal box control is cut out, is also shown in an accompanying illustration. The number plate shown indicates that the signal belongs to a box known by the distinguishing letter "F."

Old electro-pneumatic tunnel signal in "clear" position, showing spectacle plate, counterweight, air cylinder, lamp and circuit controller

Modern lamp-type tunnel signal, with relay case and wiring, showing signal box designation and number plate and "A" sign

---

IRON & STEEL CONTROL LIAISON OFFICES.—The Ministry of Supply announces that from July 31 the following Liaison Offices of the Iron & Steel Control ceased to operate:

3, Exchange Place, Middlesbrough
15, Ranmore Park Road, Sheffield, 10
116, Blythswood Street, Glasgow, C.2
263-265, Hagley Road, Edgbaston, Birmingham, 16

All matters hitherto dealt with by the Liaison Officers should be referred to the appropriate Director at the headquarters of the Iron & Steel Control, Ashorne Hill, near Leamington Spa, Warwickshire. The Sheffield offices of the Spring and Scrap Sections of the Control, and of Iron & Steel Disposals Limited and the Alloy & Special Steel Sub-Control, will continue to operate from 15, Ranmore Park Road for the time being. Iron & Steel Disposals Limited and the Scrap Section of the Control at Middlesbrough will contineu to operate from Midland Bank Chambers, Middlesbrough. The Scottish Office of Iron & Steel Disposals Limited will continue to operate from 116, Blythswood Street, Glasgow, C.2. The Drop Forging Sub-Control and the Midland Area offices of the Iron & Steel Control Scrap Department, Iron & Steel Disposals Limited, and British Iron & Steel Corporation (Scrap) Limited, will continue to operate from 263, Hagley Road, Edgbaston, Birmingham, 16.

NEW ROPEWAY IN SWITZERLAND.—A new ropeway was opened on June 24 between Bristen and Golzernalp, in Switzerland. Bristen is a few miles from Amsteg, on the northern section of the Gotthard line of the Federal Railways. The new ropeway has a length of 3,165 ft., and negotiates a difference in altitude of 1,460 ft. The one-rope system has been adopted, and it has been built by Maschinenfabrik Bell, of Kriens-Lucerne.

RAILWAY NEWS SECTION

PERSONAL

Sir Frederick Rebbeck has resumed the Chairmanship of Harland & Wolff Limited. He vacated it temporarily in 1943 to concentrate on vital matters of production, but retained the Managing Directorship. Sir Frederick Rebbeck is a member of the managing committee of the Northern Counties Committee, L.M.S.R.

Mr. A. J. White, Chief of Police (Southern Area), L.N.E.R., who, as recorded in our July 13 issue, has been appointed Advertising Manager, was educated at Bedford Modern School, and joined the Great Northern Railway at Peterborough in 1913. During the war of 1914-18 he served with the Artists' Rifles, and was commissioned to the Northamptonshire Regiment. In 1924 Mr. White secured first place in the first competitive traffic apprenticeships examination held in the L.N.E.R. Southern Area, and subsequently received three years' special training as a traffic apprentice, after which he filled various posts at Edinburgh, Glasgow and York. He joined the Chief General Manager's Office in 1929, as Assistant to the Industrial Agent, and in 1934 was appointed Commercial Advertising Agent. He was closely concerned with the Home Guard from its inception, acted as a Zone Liaison Officer for the L.N.E.R., and later commanded the 17th City of London (L.N.E.R.) Battalion, H.G. Mr. White was appointed Chief of Police (Southern Area) in January, 1943.

Mr. A. J. White

Appointed Advertising Manager, L.N.E.R.

Sir Eugene Ramsden, Bt., (a Director of British Insulated Callender's Cables Limited) who received a Barony in the King's Birthday Honours, has taken the title of Baron Ramsden, of Birkenshaw in the West Riding of the County of York.

The Baronetcy of the United Kingdom conferred on Air Chief Marshal Sir Wilfrid Rhodes Freeman of Murtle in the County of Aberdeen, which was notified in the King's Birthday Honours, was gazetted on July 24. Sir Wilfrid Rhodes Freeman is a Director of Babcock & Wilcox Limited.

Mr. E. J. Beckwith, M.I.Loco.E., M.Inst.T., who, as recorded in our May 4 issue, has been appointed Chief Mechanical Engineer of the Buenos Ayres & Pacific Railway, is a son of the late Mr. Arthur H. Beckwith, at one time Assistant Chief Mechanical Engineer of the Cordoba Central Railway (now merged with the Argentine State Railways). Mr. E. J. Beckwith served his apprenticeship as a mechanical engineer in the Alta Cordoba workshops of the Cordoba Central Railway. Early in 1916 he joined the staff of the Central Argentine Railway, with which in the course of the succeeding 12 years he held various posts in the Mechanical Department workshops at Rosario and Perez, and for a time served as Assistant to the Locomotive Running Superintendent. In 1925 Mr. Beckwith was appointed Assistant Locomotive Works Manager at Perez, which position he resigned in 1928 to take up the post of Locomotive Works Manager of the Buenos Ayres & Pacific Railway at Junín. In 1935 he was appointed Workshops Superintendent with responsibility for the workshops located at Junín, Alianza, and Mendoza. During his tenure of that office, he collaborated actively in the reorganisation of the workshops with Mr. R. E. Kimberley, whom he succeeds as Chief Mechanical Engineer. Mr. Beckwith has served for many years on the councils in Argentina of the Institute of Transport and of the Institution of Locomotive Engineers. He is at present Vice-Chairman of the South American Centre of the Institution of Locomotive Engineers.

Mr. E. J. Beckwith

Appointed Chief Mechanical Engineer, Buenos Ayres & Pacific Railway

---

Lt.-Colonel Lord Dudley Gordon, Colonel the Hon. G. K. M. Mason and Mr. R. H. Roberts are members of the newly-appointed board of the Industrial & Commercial Finance Corporation Limited. Lord Dudley Gordon is Chairman of Hadfields Limited. Colonel Mason is a Director of the Midland Bank Limited. Mr. R. H. Roberts is Chairman of Super Oil Seals & Gaskets Limited.

Alderman R. J. Hall has been appointed a Director of British Insulated Callender's Cables Limited. Alderman Hall is Chairman of the Liverpool Overhead Railway Company.

We regret to record the death on July 12, at the age of 86, of Mr. Edward Lowther, J.P., who retired in 1926 from the position of Chief Docks Manager, Great Western Railway. Mr. Lowther joined the former North Eastern Railway in 1876, in the Mineral Department, of which he eventually became Chief Inspector. In 1900 he was appointed Traffic Manager of the Port Talbot Railway & Docks Company, and two years later was made General Manager, a position which he held until 1921. In connection with the amalgamation of the Port Talbot Railway & Docks Company with the Great Western Railway Company, he then was appointed Chief Goods Manager of the latter company. Mr. Lowther occupied that post until 1924, when he became Chief Docks Manager.

(*See also editorial note*)

Elliott] [*& Fry*

The late Mr. Edward Lowther

Chief Docks Manager, G.W.R., 1924-26

Mr. W. C. Devereux has arranged to relinquish his position as Chairman & Managing Director of High Duty Alloys Limited, to devote himself to the scientific development and application of aluminium alloys over a wider commercial field than hitherto. He will retain the Chairmanship of International Alloys Limited.

Mr. T. H. Cooper, Comptroller, has been appointed Vice-President & Comptroller, and Mr. C. D. Cowie, Treasurer, has been appointed Vice-President & Treasurer, Canadian National Railways.

G.W.R. Appointments

Mr. M. H. B. Gilmour, Assistant Solicitor, Paddington, to be Solicitor to the company, Paddington, on the retirement of Mr. P. W. Pine on October 13 next.

Mr. B. B. Lewis, Chief Assistant Architect, Paddington, to be Architect to the company, Paddington, on the retirement of Mr. P. E. Culverhouse on September 30 next.

Indian Railway Staff Changes

Mr. S. M. Johnson, M.C., Deputy Chief Engineer (Bridges), N.W.R., proceeded on 6 months' leave from June 28. His place has been taken by Mr. P. S. A. Berridge, M.B.E., who was Executive Bridge Engineer (West) at Lahore.

Mr. P. C. Dewhurst, Chief Mechanical Engineer, Central Uruguay Railway, is at present on leave in England.

Mr. C. R. Dashwood has been appointed a Director of the Birmingham & Midland Motor Omnibus Co. Ltd., in place of Sir Ralph Cope, who has resigned. Mr. Dashwood is Chief Accountant to the Great Western Railway, in which position he succeeded Sir Ralph Cope on the latter's retirement in 1938.

South African Railways & Harbours

Mr. W. E. Purvis, Administrative Secretary to the Minister of Transport, Pretoria, has been appointed Chief Superintendent (Parliamentary).

Mr. G. A. W. Duncan, Mechanical Engineer, Pietermaritzburg, has been appointed Locomotive Superintendent, Pretoria.

Mr. T. V. More, System Engineer, Port Elizabeth, has been appointed System Engineer, Durban.

Mr. E. C. Best, District Electrical Assistant of the L.N.E.R. at Nottingham, is retiring from the company's service.

Among those who have accepted invitations to serve as members of the Industrial Advisory Panel of the Finance Corporation for Industry Limited are Mr. G. E. Beharrell (Managing Director of the Dunlop Rubber Co. Ltd.), Mr. John Brown (Secretary of the Iron & Steel Trades Federation), Mr. Harold Hobson (Chairman, Central Electricity Board), Mr. G. H. Latham (Chairman & Managing Director, Whitehead Iron & Steel Co. Ltd.; Managing Director, Richard Thomas & Baldwins Limited), Mr. C. P. Lister (Chairman of R. A. Lister & Co. Ltd.), and Mr. E. F. Wright (Managing Director of the Butterley Co. Ltd.).

Mr. L. F. Rowlandson, Superintendent of Organisation & Staff, Chief Commercial & Chief Operating Managers' Departments, Watford H.Q., L.M.S.R., has retired.

Dr. C. F. Goodeve, O.B.E., F.R.S., at present Assistant Controller for Research & Development at the Admiralty, is to be the head of an organisation to be known as the British Iron & Steel Research Association, which is being set up to promote co-operative research in the steel industry as a whole and to conduct general research into scientific problems concerned with steel.

Railway Research Service

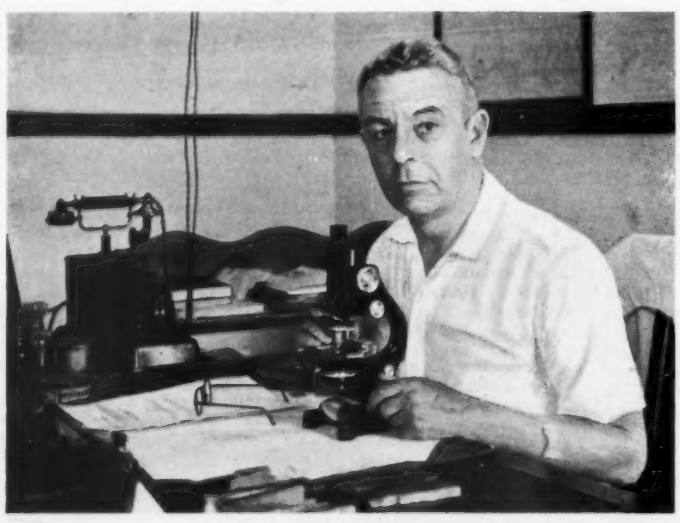
Mr. C. E. Whitworth, B.Com., has been appointed Assistant Secretary of the Railway Research Service, with effect from August 1, in succession to Mr. E. D. Brant, who is to take a Government appointment.

Mr. Whitworth was educated at Alleyne's Grammar School, Stevenage, and the University of London (London School of Economics and King's College), and gained the B.Com. degree. He was also awarded a Rosebery Prize (First Class) and an Institute of Transport Graduate Medal. He joined the London & North Eastern Railway in 1928, and gained varied experience in the Commercial and Operating Departments at different stations, and in 1929 was transferred to the Continental Department. He there obtained an extensive insight into Continental railway working, including the U.S.S.R. and Balkan countries. For a short period in 1939 he served in the Continental & Overseas Section of the Advertising Department. In August that year Mr. Whitworth was seconded to the Railway Research Service, with which he had previously served for a short period, to augment the staff of the Service for its special Government work.

Mission representing British-owned railways in Argentina about to leave by air for the U.S.A. (see paragraph below). Left to right: Mr. K. N. Eckhard, Major R. K. Hubbard, and Mr. W. P. Dobson

As recorded in our June 29 and July 20 issues, a mission representing British-owned railways in Argentina, headed by Major R. K. Hubbard, Co-ordinator for Post-War Planning of British-Argentine Railways, recently arrived in the U.S.A., to study the latest developments in diesel traction in that country. The other members of the mission are Mr. K. N. Eckhard, Chief Electrical Engineer, Central Argentine Railway, and Mr. W. P. Dobson, Sub-Chief Mechanical Engineer, Buenos Ayres Great Southern and Western Railways (see illustration above).

Awards are announced in the Fifth Supplement to *The London Gazette*, dated July 13, under the heading of Canada—Department of Transport, of the Imperial Service Medal, to 113 railway employees.



Mr. Norman Hackney
Metallurgist, N.W.R., India, 1927-45

Mr. Norman Hackney, B.Sc. (London), F.R.I.C., M.I.S.I., F.C.S., M.Inst.Met., Metallurgist, North Western Railway, India, has been permitted to take leave preparatory to retirement on grounds of ill health. He was born in Norfolk in 1891, and was educated at Queen's College, Taunton, where he was afterwards Junior Science Master for a short time. He saw service in the war of 1914-18, and was wounded in the first Battle of the Somme. He was discharged from the Army in 1917, and joined the staff of Riley & Harbord (now Riley, Harbord & Law) Consulting Metallurgists and Analytical Chemists, in London. In 1919 Mr. Hackney was appointed Assistant Metallurgist on the Great Indian Peninsula Railway; and after some eight years in Bombay he went to the North Western Railway, at the time of the inauguration of the present laboratory, as Metallurgist. In 1940 his services were lent to the Department of Supply, and for 2½ years he acted as Deputy-Director of Metals under Sir Guthrie Russell, after which he returned to the N.W.R. During the time Mr. Hackney has been with that railway the number of samples passing through the laboratory has increased from an average of less than 100, to between 600 and 800, a month.

TRANSPORT SERVICES AND THE WAR—305

Re-instatement of G.W.R. Staff

The Great Western Railway Company is anxious that all former employees transferred temporarily to other industries should return to railway service as soon as possible, and with this object in view they are asked to communicate without delay with the head of the department in which they were previously employed.

London Coach Trips to the Coast

The Regional Transport Commissioner for London has decided, with the approval of the Minister of War Transport, that motorcoach journeys for holiday outings or recreational tours, which are at present limited to 25 miles each way, may be extended to include journeys from London on Sundays in August and September and on August Bank Holiday Monday to any coastal resort on the south or east coasts extending from Southsea to Clacton. Each operation must be confined to one day only, all passengers returning the same day.

L.N.E.R. Service to Broad Street Resumed

From Monday, July 30, a limited through service was restored between stations in the London suburban area of the L.N.E.R. and Broad Street, L.M.S.R. Trains which now start from Broad Street are those which previously left Kings Cross, except Saturdays, at 4.15, 4.46, and 5.53 p.m. for Hertford North, 5.20 p.m. for Welwyn Garden City, and 6.10 p.m. for Hatfield; and on Saturdays at 12.20 p.m. for Cuffley, 12.38 p.m. for Hatfield, 12.50 p.m. for New Barnet, and 1.34 p.m. for Hertford North. Up trains which now run daily to Broad Street are those previously due in Kings Cross at 7.56, 8.21, 8.40 and 8.50 a.m. from Hertford North, and 9.28 a.m. from Welwyn Garden City.

L.M.S.R. Irish Steamer Services

For the first time since the outbreak of war in 1939, the L.M.S.R. is now making public the sailing times of the steamers between England and Ireland. It is announced that from August 1 onwards the Larne steamer, connecting with the 4.50 and 4.55 p.m. boat trains from Euston, leaves Stranraer Harbour about 7.15 a.m. In the reverse direction, departure from Larne Harbour is at about 6.40 p.m., in connection with the 4.50 p.m. and 5.20 p.m. trains from Belfast (York Road), and the 10 and 11.20 p.m. boat trains from Stranraer Harbour to Euston.

On the Heysham-Belfast route, the steamer is announced to leave Heysham Harbour about 11.50 p.m. in connection with the 3 p.m. Heysham boat train from Euston; the steamer leaves Belfast for Heysham Harbour at 9.15 p.m., connecting with the 8.18 a.m. boat train to Euston.

On the Holyhead service, connecting with the 8.15 a.m. Irish Mail from Euston, the steamer leaves Holyhead at about 4 p.m.; on the return journey, departure from Dun Laoghaire is at 7.50 a.m. (Eire time) to connect with the 1.45 p.m. Irish Mail from Holyhead to Euston.

U.S.A. Railway Carriage Pool

The U.S. Office of Defense Transportation announced on July 18 that all railway carriages throughout the country have been placed in a pool under a plan for establishing machinery for the withdrawal of carriages as required by the armed services. The order does not restrict civilian traffic, but provides that all passenger carriages and luggage vans be used for such purposes as directed by the O.D.T. The O.D.T. added that the passenger equipment requirements of the Army under its redeployment scheme will reach such proportions as to render necessary eventually the suspension of some regularly-scheduled passenger trains.

Canadian Army Sleepers

In an effort to secure speedy and comfortable journeys home for repatriated servicemen, the Canadian Army has formed its own Armed Forces sleeper unit, it was announced on July 5. The unit provides sleeping accommodation from disembarkation ports to home depots. One hundred out-of-date colonial coaches have been leased to the Army by the Canadian National and Canadian Pacific Railways. Each coach may carry from 50 to 54 persons. They have been converted and redecorated according to army requirements, and equipped with sheets, blankets, pillows, and towels. The bunks have been supplied with spring mattresses.

Restoring Burma Railways

The first train from Rangoon to Pegu reached Pegu on July 18. Northwards from Rangoon 134 miles of the Mandalay line are in use with three trans-shipments; and 161 miles of the Prome Line, with two trans-shipments. The Bassein-Henzada line, 82 miles long, is working. In Upper Burma 202 miles of line are in use. Damage to rolling stock has been less than was expected; 37 captured locomotives have been repaired. Damage to the permanent way appears to have been unnecessarily heavy. More than 4,000 railway employees have reported for duty, and more are reporting every day. It is proving difficult to cope with these because of the lack of senior British staff; the departmental heads of the railway administration are still in Simla. The objective is to restore the Rangoon-Mandalay line to full working order by the end of this year.

Paochi-Tienshui Railway

When it was announced on March 23 that 31 miles had been completed out of the total of about 100 miles of the Paochi-Tienshui Railway, traffic over the entire line was expected in the autumn, and a trial trip was scheduled for October 10.

Kweichow-Kwangsi Railway

The completion of this vital communication artery in the vast North-West of China has had to be deferred, however, as a result of a sunken roadbed caused by loosening of the soil. All available hands are working on the line, and it is expected to be completed by the end of the year.

Vorarlberg Railway Services

Through train services were instituted between Bregenz and Innsbruck (120 miles) on July 9, the day when the French occupation zone was extended to northern Tyrol, previously occupied by the Americans. St. Anton am Arlberg, on the former demarcation line between the zones, is thus no longer the eastern terminus of the Vorarlberg railway services.

Reichsbahn Property in Switzerland

The difficulties arising from rival claims to the administration of the German Reichsbahn property at Basle, as reported in *The Railway Gazette* of July 20, have now been resolved, and the Swiss Federal Council has passed a Decree providing for the trustee administration of the property, including the station. We now learn that this was taken over by the Swiss as from July 13. The Decree also covers German railway property at Schaffhausen. M. Emile Meyer, Chief of the Swiss Federal Railways Inspectorate at Basle, is head of the trustee administration.

Geneva-Cerbère Transit Service

From July 1, the daily fast train linking Switzerland (Geneva) with Spain (Cerbère), in transit through France, and which was worked experimentally for a few weeks, has been converted into a permanent service. The train now leaves Geneva (Cornavin Station) at 4.20 p.m. (Swiss time), and arrives at Cerbère at noon (Spanish time) on the next day.

Inter-Zone Traffic in Germany

According to a press message of July 23, railway traffic between the various zones of occupation in Germany has been resumed.

Rome-Milan Direct Service

Direct train services between Rome and Milan were resumed on July 16, according to an Italian message, but the route used has not been stated.

Continental Travel Restrictions Relaxed

All travel restrictions between France on the one hand and Sweden, Switzerland, and Luxemburg on the other, have been lifted, according to a Paris message of July 19.

Paris-Switzerland Through Trains

Railway communications between France and Switzerland, reorganised during the first half of 1945, have been characterised by the absence of through-trains between Paris and the Swiss termini, a result of the roundabout routes which had to be followed because of repair work still in hand. Through traffic between Paris and Geneva, over the main line which crosses the Pyrimont Viaduct, was resumed on July 6. Traffic on the Besançon-Morteau-Le Locle line was resumed on July 8 after a break of more than five years.

Polish Railways

Control of the Polish railways is being transferred from Russian to Polish hands by stages from August 1, according to a Warsaw radio report.

It was announced in Moscow on July 18 that a Soviet-Polish agreement on tourist facilities providing, in the first place, for "mass excursions," had just been signed. Inter-State credits will be opened to finance tours by parties of trade union members and public organisations. Similar agreements are being negotiated by Russia and Poland with Jugoslavia, Czechoslovakia, and Sweden.

Heavy Transit Traffic in Switzerland

After the beginning of Germany's collapse, a heavy strain was thrown on the Swiss railways as internees and members of foreign labour forces began to pour into Switzerland from Germany. From April 18 to June 30, the Swiss Federal Railways conveyed 88,200 refugees of all nationalities from the Swiss frontier in the north to destinations in the interior. During the same period, 62,540 refugees and internees were conveyed to other frontier stations on their way out of the country. This traffic required 126 special trains, including 49 transit trains crossing Switzerland from one frontier station to another. To this traffic must be added the conveyance of the thousands of civilian internees and refugees of various nationalities who had found refuge in Switzerland, Jugoslavs, Greeks, Roumanians, Russians, Italians, Poles, Czechoslovaks, and Germans, numbering more than 60,000.

Allied Leave Trains through Switzerland

In accordance with an agreement between the British High Command in Italy and the Swiss Government, members of the British Forces in Italy returning to the United Kingdom for demobilisation or on leave will cross Switzerland by the Simplon route *via* Lausanne and Vallorbe, for Paris and Calais. Three special trains a day, with accommodation for 2,000 men, will operate between Milan and Calais and the return trains will

convey men returning from leave, and civilian repatriates on their way to Italy. The transit agreement covers a period of six months from July 15, but may be extended. The first train entered Swiss territory at Brigue on July 23, and proceeded *via* Lausanne to Vallorbe. It carried 600 officers and other ranks, who were warmly welcomed by the population at places where the train stopped.

A leave agreement has also been concluded between the American High Command and Switzerland, according to which some 250,000 or 300,000 men of the U.S. Forces stationed in France, Germany, and Italy will spend their leave in Switzerland. The men will enter Switzerland in groups of 10,000, and each group will stay in Switzerland seven days. This agreement is to last for two years.

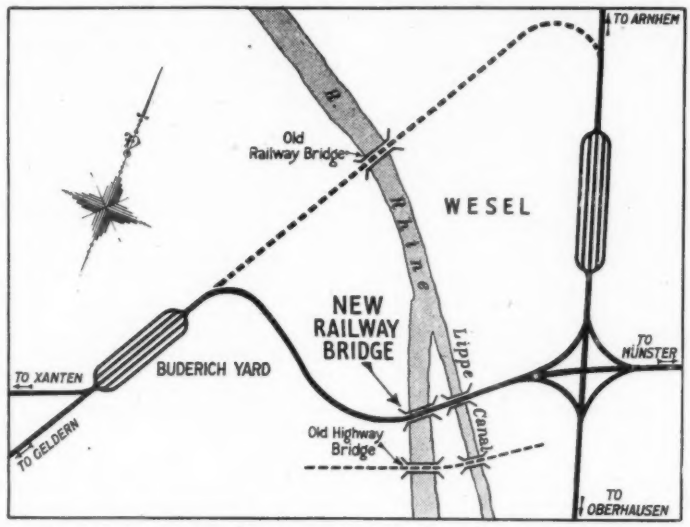
Transfer of Russians via Sweden

Under an agreement between the Soviet Union and Sweden, Russian ex-prisoners of war from Norway are being evacuated to Russia over Swedish railways. Some parties are going *via* Haparanda and thence by rail through Finland, others are embarking at Swedish ports. It is reported that 75,900 Russians had crossed Sweden by July 12, and that the whole operation was to be concluded by August 1. It will be remembered that, during the European war, Sweden agreed to the passsage through her territory of German forces and soldiers on leave between Norway and Germany, as well as between north and south Norway (the so-called " horse-shoe traffic "). This German transit traffic was stopped early in 1944.

Transport in Berlin

Steady progress is being made with the restoration of the Berlin local transport system. The public services of tramways, buses, and underground railways are now carrying 1,300,000 persons a day, compared with 4,000,000 before the war. Lack of fuel is the chief limiting factor with the bus services, and only seven normal routes are operating for a daily total of 60,000 persons. Bus services are also in operation where tramcar services cannot be restored, largely because of the lack of overhead cables. Tramcars are covering 58,000 km. a day and are carrying 600,000 passengers.

The local passenger services of the German State Railway, known as the *S-Bahn*, which run mainly on elevated structures, are virtually non-existent apart from disconnected stretches where the track is still intact. The underground section of the *S-Bahn* between the Anhalt and Stettiner stations has been flooded since the fighting in Berlin, and divers who went down recently to investigate the prospects of clearing it found so many corpses there—mostly of German soldiers who had died of their wounds—that, despite offers of increased pay, they have refused to go down again. The Germans themselves deliberately flooded the tunnel to prevent Russian troops from filtering underground.



Location of Allied railway bridge at Wesel, showing sites of old railway and highway bridges

The Rhine Bridge at Wesel

In our issue of June 8 we published two illustrations and a brief description of the first railway bridge built by the Allies across the River Rhine, namely that at Wesel. The accompanying sketch map shows the location of this bridge in relation to the demolished railway bridge, and also the demolished highway bridge, and indicates the modified railway connections which were necessitated by the site. It will be noticed that it provides a short-cut to Münster and thence to Hanover and Berlin, and also direct running towards Arnhem, not previously possible; the distance by rail to Oberhausen and the south, moreover, is reduced appreciably.

In addition to these advantages secured by the location of the new bridge, it was estimated that to repair the old bridge would take at least a fortnight longer than to build the new bridge on the site finally selected. This was due as much to the almost complete destruction of the old bridge—the debris of the spans of which would have had to be removed from the piers—as to its height and 3,500-ft. length. The aggregate length of bridging over the Rhine at the new site and of the adjacent Lippe Canal is only 2,215 ft. It is of interest to note that the Germans themselves had begun rebuilding the wrecked road bridge as a combined road and rail structure.

Railroading under Fire, Canadian Pacific Style

By Ronald Clark

Working the 50 worst miles of rail track in history, driving into 'sHertogenbosch under shell fire from the enemy across the Meuse, operating one end of the Cleve railway yards while the other end was under shell fire, and running trains across a Seine bridge which was theoretically no longer workable, are some of the items in the record of the Canadian Railway Operating Group which was the spearhead of Montgomery's drive into the Reich.

About 75 per cent. of the officers are Canadian Pacific Railway men. Since the end of last August the group has been carrying out one of the toughest railway operating assignments in history. It is the only railway group to operate on the 21st Army Group sector in Germany in wartime. It was formed in 1943 by Lt.-Colonel F. E. Wootton, a veteran of the last war who was previously Assistant Superintendent of the Canadian Pacific Railway at Kenora, Ontario. Now it has been built up into two companies comprising 800 officers and men, all of them railwaymen from Canada. One company was formed in Canada and the second was recruited in Great Britain from railwaymen serving in other branches of the Canadian Forces.

The Unit is now living in railway coaches and huts in the Rheine area and is operating the lines between Cleve and Bremen with German engines, for which the men have the highest praise. After landing at the end of August, the group operated railways across France and then across the famous Seine bridge, which was constructed below the flood level. More than once it was operated while the tracks were below the level of the water. The worst 50 miles of railway were between Elbœuf across the bridge as far as Serqueux where the Le Havre to Amiens and the Dieppe to Paris lines crossed. It was without lights and with many grades of 1·6 per cent., operated with heavy loads and in nightmare conditions. Most of it was night-work.

Records for work were put up throughout the winter. It was reported that more than 90 hours were worked at a time. One man arrived on the line from 37 hours on the footplate with the locomotive whistle jammed and shrieking. He had had 37 hours with that whistle in his ears, but he stopped for half an hour and then set off for the rest of the journey, which took him another 18 hours.

The company first operated British and U.S.A. 2-8-0 or 2-10-0 engines, but now is using only German locomotives, including a number with condensers taking the steam from the exhaust back into the water tanks; these were built by the Germans for the Russian campaign, and travel one mile on three gallons of water instead of the usual one on 40.

The German railway system is more nearly similar to the Canadian than any yet met by the company, according to reports from these Canadian railwaymen. One said, " It is the nearest that we've used, so far as yard layout, equipment, and the use of the Westinghouse brake systems are concerned."

In addition to operating in France and Germany, and also occasionally in Holland, where the 'sHertogenbosch shelling occurred, the group has also sent 40 men to Belgium to help operate the Belgian railways, and has operated a special Lille-Liege train which moved General Eisenhower into the Ardennes during the critical period of Runstedt's offensive.

The Great Western of Brazil Railway Co. Ltd.

The ordinary general meeting of the Great Western of Brazil Railway Co. Ltd. was held at River Plate House, London, E.C.2, on August 1. Mr. W. M. Codrington, M.C., Chairman of the company, presided.

The Chairman, in the course of his statement issued with the report and accounts, said: The accounts once again show that the gross receipts in currency have reached a new record. It is disappointing to have to record that this increase has been overtaken by a rise in the working expenses with the result that the net receipts in Brazil compared with last year show a decline of £64,360. In my statement last year I foreshadowed that the ratio of working expenses would show an increased tendency to rise; and I alluded to the effect of bad weather, high fuel costs, and increased wages.

The rainfall during 1944 eclipsed even that of 1943, which was regarded as heavy. During the year no less than 100 inches fell in Recife, compared with the average of about 70 inches, and as much as 32 inches fell within the single month of May, 1944. Moreover, the rainy season, instead of finishing in August, continued to the end of September. Interruptions to traffic, serious damage to three bridges, the washing out of embankments, heavy falls of earth and rock in cuttings, not only affected our receipts but involved increased costs in the Way & Works Department. In addition, these conditions hampered the collection and distribution of wood fuel, with the result that in order to keep moving the traffic, including a large volume of war stores for the U.S.A., we had to resort, to an even greater degree than I had anticipated, to the use of imported coal and oil fuel. This involved an increase in our fuel bill of no less than £81,000 over that for 1943.

On September 18, 1944, we were authorised to put into force a further increase of 20 per cent. in our rates which had become necessary in order to meet the cost of the higher wages scale which had, however, been ordered as from December 1, 1943. We had every hope that this increase in our charges would suffice to meet the higher rate of wages, provided that these remained unaltered. Since the end of the financial year, however, the Government have authorised further advances in salaries and wages to meet the continuing rise in the cost of living. This is expected to cost us some ten million cruzeiros annually. The Government have at the same time granted us authority to raise provisionally our existing tariffs by 30 per cent., pending the submission by us of a definite proposal for the revision of all our charges.

Conditions in Brazil, as a result of the pressure and stress of the war and its after-effects, are undergoing a rapid evolution. This situation now demands that, in order to be able most effectively to handle the ever-increasing financial and economic problems facing us there, our present representation in Rio de Janeiro, headed by our colleague, Mr. Gudin, should be constituted as a Local Board or Committee. We are therefore submitting a special resolution to an extraordinary general meeting to enable this to be put into effect.

It may be remarked in passing, as an indication of the change in values which is going on in Brazil, that while our gross receipts in 1938 only amounted to £420,858, the higher wages now ordered may bring our wages bill up to £517,000 per annum, compared with £203,000 in 1942 and £150,000 in 1938. It is true that augmented rates have been followed by successive increases in tariffs. On the other hand, during the war years, road competition in our zone has been very much reduced by shortages of vehicles, tyres, and spare parts; and the possibility that importation of road vehicles may begin before long makes it all the more urgent that some steps should be taken by the Government to control road competition and co-ordinate this form of transport with the railways, which will always be the mainstay of the transport organisation in a producing country.

Our sleeper position causes us concern. Due to the shortage of labour, high prices, and the continuous wet season, the re-sleepering programme was reduced by 50 per cent.; moreover, each sleeper cost an average of 15 cruzeiros compared with the price of 8 cruzeiros ruling until a few years ago.

During the year we were able to pay off only 1½ year's arrears of debenture interest, with the result that our income tax liability calls for the provision of £22,149 against nil in 1943. On the other hand, Brazilian income tax is £7,803 lower. The burden of double taxation continues to press heavily on this company. An agreement was signed a few months ago between the British and United States Governments providing for reciprocal taxation relief. As yet there has, unfortunately, been no indication of any similar arrangement being contemplated with Brazil.

It is, of course, still too early to make any firm estimate of the probable results of the current year's working. Transports during the first three months were very heavy, but it is uncertain whether between-crop traffics will attain the exceptionally high volume reached last year; and it is always difficult to assess accurately the probable net effect of increased wages and tariffs under economic conditions susceptible to rapid change.

The management of a railway in times like these is beset with difficulties and anxieties, economic, technical, and financial. At the head of our affairs in Pernambuco we have in Dr. Manoel Leao a man of outstanding calibre, whose gifts of leadership, no less than his technical skill are appreciated as much by his own countrymen as they are by the board in London. To him and his staff I express our thanks for their skill and devotion.

Staff and Labour

Gallantry of Railwaymen

The George Medal has been awarded to Mr. Herbert Norman Stubbs, fireman (Workington), L.M.S.R.

As a train, the leading seven wagons of which contained depth charges, was in motion, the sixth wagon from the engine caught fire. Fireman Stubbs, the train having been stopped, unhooked the rear coupling of this wagon, and ran forward to the engine, telling the driver to draw ahead. While the engine was still in motion he jumped from it to be opposite the wagon when it came to rest. By this time the wagon was burning fiercely, but Stubbs, who realised that its contents were dangerous, uncoupled it from the other five. He ran to the engine for detonators to protect the other line, and had correctly placed the first when contents of the wagon exploded. He placed four more detonators before returning to the scene of the explosion, where he was informed that the driver had been killed.

The alertness of Stubbs in detecting the fire and his courageous action in so quickly isolating the burning wagon undoubtedly prevented a far more serious explosion.

The B.E.M. has been awarded to Mr. Cyril William Annetts, locomotive driver (Salisbury), Southern Railway, for courage, coolness and initiative when fire broke out in one of 46 wagons which his engine was hauling. He isolated the burning wagon, which contained thirty 40-gallon drums of petrol, and prevented the flames reaching the others.

L.P.T.B. Administrative Staff

The National Arbitration Tribunal recently has issued its award on a claim submitted to it on behalf of the administrative staff in the assistant and special classes employed by the London Passenger Transport Board. A claim was made by the London Passenger Transport Staff Association that an extension of the normal working week should be accompanied by a "pro rata" extension of the normal rate of payment.

Representatives of the parties were heard at a sitting of the tribunal held in London on June 25, 1945. Statements were made and documents submitted as to: The lower limit of basic salary of the classes of employees to whom the claim relates; the normal working week prior to February 12, 1943, of these classes, namely, 38 hours exclusive of meal times; the condition at that time that staff were expected to work, without additional payment, such occasional overtime as was necessary; the terms of a circular issued by the Minister of Labour & National Service in February, 1943, referring to hours of work in offices in relation to economy in man-power; the decision of the Board to increase the normal office hours as from February 22, 1943, from 38 to 46 a week; the reduction of the normal working week to 42 hours as from January 1, 1945; the payments made by the Board to the staffs concerned for the additional normal hours worked, compared with the equivalent hourly rates of the different annual salary rates; the practice of H.M. Treasury, of a number of local authorities, of other employing concerns and of individual employers regarding payment for longer working weeks; the terms of Award No. 1 of the London County Council Standing Arbitration Tribunal; the grounds on which the claim is made by the staff association; the question of the authority of the association to negotiate on behalf of the special class staff; the contention of the Board that during wartime it is controlled by the Railway Executive Committee as agent for the Ministry of War Transport and that the rate of remuneration of special class staff in respect of extended working hours was one for determination by such Executive Committee; the decision of the Executive Committee that such rate of remuneration to be paid by the Board and the main-line companies should be 3s. 6d. an hour; the contention of the Board that any payment for overtime to special class staff is an *ex gratia* concession and that the relationship of such payment to the flat hourly rate of the various employees is therefore irrelevant; and their further contention that since the increased normal hours have been reduced to only four a week, the hours

now worked for the majority of the workers, are no more than the average they worked before the war without additional remuneration

The Tribunal finds that the claim has not been established and it awards accordingly.

Trent Motor Traction Co. Ltd. Part-Time Staff

The National Arbitration Tribunal recently has declined a claim brought by the National Passenger Workers' Union that a certain part-time employee of the Trent Motor Traction Co. Ltd. should either be employed as a full-time worker or be dismissed.

Representatives of the parties were heard on July 11, when statements were made as to the company's practice over a period of some 20 years to negotiate with the Transport & General Workers' Union rates of wages and conditions of employment for workmen in the company's employ; the terms of an agreement dated June 30, 1938, between the company and the Transport & General Workers' Union; the non-recognition by the company of the National Passenger Workers' Union and the union's non-representation on the National Council of the Omnibus Industry. Reference was also made to the terms of a letter dated May 5, 1945, sent by the Midland Organiser of the National Passenger Workers' Union to the company regarding a resolution passed by members of the union at a meeting held at Derby on March 6, 1945, requesting the company to discontinue part-time employment of the driver concerned, either by employing him full-time or dismissing him, and giving 21 days' notice of withdrawal of labour in the event of the request not being acceded to. The company contended that, having regard to the agreements entered into by it with the Transport & General Workers' Union and to its commitments as members of the National Council of the Omnibus Industry, negotiations cannot properly be entered into with the National Passenger Workers' Union.

The Tribunal, under the chairmanship of Sir John Forster, finds against the claim and awards accordingly.

Transport & General Workers' Union's Conference

Mr. Ernest Bevin, back with the Transport & General Workers' Union, announced details of a proposed industrial charter to the conference of the union which ended at Blackpool on July 19.

A resolution was carried calling on the Government to undertake the careful planning of industry so that it might be designed to meet the needs of the population, maintain a balanced distribution of industry, eliminate the dangers of segregated unemployment, and provide a high and stable level of employment. It also demanded that the State should undertake to pay a wage not less than the basic wage of the trade concerned until the person was offered employment at a wage commensurate with that standard.

The industrial charter adopted by the conference instructed the executive to seek to secure the principle of a guaranteed week and the maintenance of the machinery under the Essential Work Order which provided for the right of appeal against dismissal. It asked for the consolidation of all war bonuses into standard rates of wages, having regard, in fixing new wage rates, to the change in money values. There should be a progressive reduction in working hours and an elimination of overtime, unless it was absolutely essential, to arrive at a standard 40-hr. working week without reduction in wages. The principle should be established of two weeks' annual holiday with full pay throughout industry and payment in addition for six statutory holidays.

Mr. Bevin said that where women were engaged in what hitherto had been regarded as women's work, the union would endeavour to secure a standard commensurate with the basic wage for men in the same industry.

The charter also asked for the training of youths and girls employed in industry to avoid "blind alley" occupations, and that more attention should be paid to the prevention of accidents, ill-health, and disease in industry. Canteens and medical and welfare services introduced during the war should be continued.

Royal Commission on Equal Pay

The Royal Commission on Equal Pay, which was appointed in 1944 under the chairmanship of Mr. Justice Asquith, heard the evidence of the British Employers' Confederation on July 20.

Sir John Forbes Watson, Director of the Confederation, said that the field in which men and women in industry were doing identical jobs was very narrow, but where the work was absolutely identical men and women were paid the same. If the Government adopted equal pay for equal work for its own employees, the repercussions on industry might be serious. If costs were to go up by some method which merely said that women were to be paid the same as men, he thought that industry just could not afford it.

Demolition of Rhydyfelin Viaduct

DURING the war, but unrecorded because of the requirements of censorship, a link with the now partly-abandoned Cardiff Railway disappeared with the demolition of Rhydyfelin Viaduct, near Treforest, South Wales, in the latter part of 1942. The steelwork in this structure, amounting to nearly 1,150 tons, was salvaged as scrap metal to assist the war effort.

The Cardiff Railway was constructed in 1906, and was intended originally to connect Cardiff Docks with the Taff Vale main line near Treforest, but it never fulfilled this function as a competitive mineral line for the conveyance of South Wales coal to the docks; no mineral traffic passed over it, because of difficulties in implementing the Parliamentary sanction to form the junction at Treforest which the Cardiff Railway Company had obtained. The line catered for passenger traffic between Cardiff and Rhydyfelin Halt, but no trains actually traversed the viaduct, as the halt was situated on the Cardiff side of the bridge. Passenger traffic subsequently was discontinued, and early in the present war a considerable amount of the permanent way at the Treforest end of the railway was taken up.

The viaduct was an imposing structure comprising four skew spans, each of approximately 115 ft., spanning the main Pontypridd to Cardiff road, the River Taff, and an occupation roadway. Each span consisted of two lattice girders, nearly 15 ft. in depth, carrying cross-girders with a buckled plate floor and lattice parapets 8 ft. 6 in. high. The total length of the bridge was 480 ft., with a width of 30 ft., and a clearance of 36 ft. above normal river level. The main girders were supported upon double-braced cast-iron cylinders of 8 ft. dia., filled with concrete and brickwork.

During the construction of the viaduct, the sinking of the caissons in the river bed caused much difficulty to the engineer and contractors, as a bed of running sand was encountered; in consequence, the expenditure for these foundations proved almost prohibitive. It is estimated that the original cost of the viaduct amounted to £30,000.

The first stage of the demolition work consisted of removing, by oxy-acetylene cutting, the whole of the plate floor, cross-girders, and lattice parapets. The next stage entailed toppling-over each girder into the river by means of hand-winches and pulley-blocks. The final stage consisted of cutting the main girder into sections suitable for hauling by crane to the river bank and loading into lorries for dispatch to the railhead centre. The whole of the demolition work occupied 18 weeks.

Davey, Paxman & Co. Ltd. Diesel Engines

On Saturday, July 7, members of the Institute of Marine Engineers, and of the Diesel Engine Users' Association visited the Britannia Works and the Standard Ironworks of Davey, Paxman & Co. Ltd., Colchester, to see some of the latest developments in diesel engines and other products manufactured by this company. Mr. E. P. Paxman welcomed the guests, and stated that Paxmans had developed the high-speed "Vee" type diesel engine before the war; this engine was selected for use in one of the earliest weapons designed for attack on the Siegfried Line. Very large quantities of these engines were required, but on the fall of France this requirement came to an end. Meantime, the Admiralty had chosen this engine for propulsion of tank landing craft. For the purpose of assembly, the Britannia Works were requisitioned by the Ministry of Supply and were completely reconditioned and equipped and managed by Davey, Paxman & Co. Ltd.

Not only had the vessels powered by these engines been used to land tanks but also to carry troops, stores, water supplies, prisoners of war and for many other purposes including the ferrying of trains.

Although the original intention was that these engines should run only for short periods between overhauls, improved methods of manufacture and selection of materials had greatly prolonged the running period, until at present they were operating for approximately 2,500 hours before being removed for reconditioning.

Great Western Railway First Aid Movement

Mr. Howard Jones, Divisional Superintendent's Office, Newport, has been appointed Divisional Ambulance Secretary to the G.W.R. Newport "A" Division, in succession to Mr. S. Elms, who has retired from the company's service.

Mr. R. N. Patton, Chief Mechanical Engineer's Department, Swindon, has been appointed Divisional Ambulance Secretary to the G.W.R. Swindon Division, in succession to Mr. L. G. Bretsch, who has retired from the company's service.

Mr. Bretsch was invited to attend a recent meeting of the Divisional Ambulance Secretaries' Conference, during the

course of which Mr. H. Adams Clarke, the Chairman, thanked him for his work, which he said had been of great value to the movement in general. Mr. G. S. Hodder, Bristol, supported by Mr. W. J. Waite, Worcester, paid tribute to Mr. Bretsch's services, and asked him to accept, on behalf of the Divisional Ambulance Secretaries, a Dunhill pipe, tobacco pouch, and lighter.

At a representative gathering of ambulance workers held at the Staff Association Institute, Swindon, Mr. W. H. Bodman, Personnel Assistant to the Chief Mechanical Engineer, handed Mr. Bretsch a cheque on behalf of the members of the ambulance movement in Swindon. The Chairman of the Ambulance Committee, Mr. R. Lambert, presented Mr. Bretsch with a case of pipes and tobacco from the Committee.

Southern Railway Expenditure

The Southern Railway has issued a statement showing that £31,200,000 has been expended on permanent way and works and on rolling stock during the years 1940 to 1944, as shown in table A.

Expenditure of £17,397,000 on renewals and repairs to the permanent way and to works, involved the complete renewal of 800 miles of track and the use of 1,202,664 cu. yards of ballast, 118,695 tons of rails and 2,415,620 sleepers, as shown in table B.

During the same period 53 locomotives were built in Southern Railway workshops and 4,477 locomotives were repaired; 130 locomotives were constructed for other railway companies.

Some £3,355,000 was expended on coaching vehicles; 359 vehicles were built and 61,636 repaired.

Expenditure of £3,082,000 was incurred in the construction of 6,201 wagons and the repair of 313,367, all in the company's shops; 5,130 wagons were constructed for other railways. Statistical data are given in table C.

Government war work to the value of approximately £4½ millions was carried out by the company in its mechanical and marine workshops.

Ruston & Hornsby Limited

At the recent annual general meeting of Ruston & Hornsby Limited the Chairman, Mr. G. R. Sharpley, stated that the financial condition of the associated company, Ruston-Bucyrus Limited, continued to be excellent, and its production of excavators had reached record high levels notwithstanding the additional output of Army tanks during the war. Ransomes, Sims & Jefferies Limited had had another successful year. In the consolidated statement of the parent company the reserves amounted to practically £1,250,000. The post-war contingencies reserve had been brought, in the aggregate, up to £300,000.

Tank landing craft powered by engines of the company's subsidiary (Davey, Paxman & Co. Ltd.) worked through special oil-operated gearboxes, many of which were constructed in Ruston factories. The company's engines were the power units for British railway signalling and telegraph, for telephone exchanges and for petrol pumping on aerodromes and for harbour defences. Hundreds of the company's oil-engined locomotives had helped our troops to maintain their lines of supply, assisted in airfield construction, and carried bombs.

War conditions had brought about an interchange of views and experience between a large number of engineering firms. The company was determined to benefit from this experience.

TABLE A—TOTAL EXPENDITURE

Year	Permanent way and works	Locomotives and rail motor vehicles	Coaching vehicles	Wagons	Total
	£000s	£000s	£000s	£000s	£000s
1940	2,852	1,222	737	453	5,264
1941	3,099	1,205	628	414	5,346
1942	3,515	1,517	669	614	6,315
1943	3,680	1,463	618	814	6,575
1944	4,251	1,971	703	787	7,712
Totals	17,397	7,378	3,355	3,082	31,212

TABLE B—PERMANENT WAY EXPENDITURE

Year	Track renewed		Ballast	Rails	Sleepers
	Miles	Ch.	Cu. yd.	Tons	No.
1940	151	30	233,619	22,119	465,182
1941	163	65	246,397	24,630	458,328
1942	161	23	248,354	21,845	482,495
1943	168	—	231,450	25,469	513,840
1944	155	52	242,844	24,632	495,775
Totals	800	10	1,202,664	118,695	2,415,620

TABLE C—STATISTICAL DATA

Year	Locomotives		Carriages		Other coaching vehicles		Wagons	
	Renewals	Repairs	Renewals	Repairs	Renewals	Repairs	Renewals	Repairs
1940	—	863	26	9,710	141	2,596	1,116	54,758
1941	7*	873	2	9,416	14	3,049	806	57,895
1942	44	800	—	9,026	124	2,847	1,049	60,852
1943	—	862	—	9,348	41	2,580	2,156	67,902
1944	2	1,079	2	10,282	9	2,782	1,074	71,960
Totals ...	53	4,477	30	47,782	329	13,854	6,201	313,367

* Includes 1 electric locomotive

Malines Railway Workshops

British Army engineers have a fine achievement to their credit at the railway workshops at Malines, Belgium, where they have cleared thousands of tons of debris resulting from our bombing attacks and reconstructed two sheds for repairing British Second Army rolling stock. The sheds were taken to the Continent in sections, complete with heavy machinery and two 40-ton cranes that can lift an 80-ton W.D. locomotive.

Malines was one of the most up-to-date and largest railway repair yards in Europe. It had been completely overhauled in 1936. A month before the invasion the R.A.F., softening up German defences and lines of communication, had shattered the buildings. No repairs had been effected by the Germans. The conversion from a blitzed yard to a good-going concern was carried out mainly by men of the 155 Railway Workshops Company, Royal Engineers, which was responsible for similar work in connection with the supply line to Russia, *via* Persia. Many of the engineers were employed on British railways before they became soldiers, and some on British-owned railways in Argentina. The story of the reconstruction of the workshops is one that ranks high in the many achievements of British Second Army.

On September 3, 1944, when the Germans left Malines, a reconnaissance party of engineers rushed forward to check the R.A.F. damage. They found locomotives and coaches piled on top of one another; huge craters; twisted machinery; and slabs of concrete, several hundred tons in weight, scattered in profusion about the sheds and lines. The plant was entirely wrecked. They decided that the best plan was to build immediately a repair shop for light urgent work on W.D. locomotives. This was not an easy job, as all the wrecked shops had been reinforced with concrete and the bombing had left mountains of rubble which would have taken months to clear. The original carriage paint shop was chosen as the most suitable building remaining, and, within a fortnight of the first pile of debris being shifted, the first locomotive had been repaired. Within six months, after two sheds had been built, more than 100 locomotives had been repaired by the Company, including a number of Continental types.

The second shed was an even more formidable test. It had to be rebuilt completely. Once the 18,000 tons of debris had been cleared up, a High Maston shed was erected. This shed, with all the necessary heavy machinery, had been held for months before the invasion for such a purpose. It was capable of tackling heavy repairs. The clearing of the site was done at the same time as repairs on engines were being effected in the first shed. Steel coaches telescoped into one another had to be cut through; bomb craters refilled; tracks re-laid; and repair pits reconstructed before it could be built. The floor space of the second shed is 400 ft. by 90 ft., and it had to be a high-roof type to enable the engineers to erect within it two 40-ton electric cranes capable of lifting an 80-ton W.D. locomotive.

Twelve weeks after the second shed had been begun the first locomotive was run into it. Men of the 78 Railway Construction Company helped in the building, which was carried out in the bitterest of wintry weather. The officers still live on the site, in carriages fitted out as sleeping quarters. Today the repair output in both shops is between 25 and 30 locomotives a month.

Notes and News

Cost-of-Living Index.—The official cost-of-living index figure at June 30 last was 107 points above the level of July, 1914, compared with 104 points on June 1. At July 1, 1939, it was 56 points above July, 1914.

Canadian Pacific Railway Company.—The directors of the Canadian Pacific Railway Company have declared a net dividend of 50 cents. (2 per cent.) on the ordinary stock, payable on October 1, to holders registered on August 31.

Overseas Employment.—An office assistant to the chief engineer of the Kenya & Uganda Railways is required. Candidates must have a working knowledge of railway civil engineering accounting and costing methods. For full particulars see our Official Notices on page 131.

Beira Railway Co. Ltd.—For the month of May, 1945, the approximate gross receipts of the Beira Railway Co. Ltd. were £76,561 and for the eight months ended May 31, 1945, were £613,138 as compared with £89,932 and £632,217 for the corresponding periods in the previous year. The number of miles open is 204.

Registered Telegraphic Addresses to Egypt and the Sudan.—Cable & Wireless Limited announces that Egypt and the Sudan have been added to the countries to which the use of registered telegraphic addresses is authorised, both in the address and signature of telegrams. A signature is still essential in messages to Egypt and the Sudan.

Rhodesia Railways Limited.—The approximate gross receipts of the Rhodesia Railways Limited for the month of May, 1945, were £496,777 and for the eight months ended May 31, 1945, £3,988,192, as compared with £556,006 and £4,267,931 respectively for the corresponding periods in the previous year. The number of miles open is 2,445.

London Midland & Scottish Railway.—At a meeting of the Board of the London Midland & Scottish Railway Company on July 26 it was decided to make interim dividend payments for the past half-year on the 4 per cent. guaranteed stock, the 4 per cent. preference stock, and the 4 per cent. preference (1923) stock at £2 per cent. actual, less tax. Warrants for these dividends will be posted on August 21.

Southern Railway Company.—The Directors of the Southern Railway Company announce that the estimated net revenue accruing to the company for the first half of the year is sufficient to pay (less income tax at the rate of 10s. in the £) interim dividends of 2½ per cent. on the guaranteed preference and preference stocks and 2½ per cent. on the preferred ordinary stock and such interim dividends will be paid accordingly. An interim dividend of 2½ per cent. was paid on the preferred ordinary stock last year. Warrants will be posted on August 15 to proprietors whose names were registered in the books of the company on July 5.

London & North Eastern Railway Company.—At a meeting of the board of directors of the London & North Eastern Railway Company on July 26 the undermentioned interim dividends for the past half-year were declared :—2 per cent. actual for the half-year on the 4 per cent first guaranteed stock ; 2 per cent. actual for the half-year on the 4 per cent. second guaranteed stock ; 2 per cent. actual for the half-year on the 4 per cent. first preference stock ; 2½ per cent. actual for the half-year on the 5 per cent. redeemable preference stock, 1955 ; 1 per cent. actual for the half-year on the 4 per cent. second preference stock ; in each case less tax. Warrants will be posted on or about August 17.

Great Western Railway.—The directors of the Great Western Railway Company have declared an interim dividend of 2 per cent., for the half-year ended June 30 last, on the consolidated ordinary stock. Dividend warrants will be posted on or about August 21.

Jungfrau Railway.—Working receipts for 1944 of this Swiss company decreased to fr. 825,093, compared with fr. 939,468 for the preceding year. The number of passengers carried dropped to 67,954, compared with 79,441 in 1943, as a result of weather conditions adversely affecting the tourist traffic in the Jungfrau region.

London Passenger Transport Board.—The London Passenger Transport Board announces that a payment on account of interest on the London Transport "C" Stock for the financial year ending on December 31, 1945, will be made by the Board's Registrars, the Bank of England, on August 24, 1945, to all holders of London Transport "C" Stock whose names are registered in the books of the Bank of England at the close of business on July 31, 1945, such payment to be at the rate of 1¼ per cent. actual (the same rate as in the previous year) less tax at 10s. in the £.

Ruston & Hornsby Limited.—The preliminary statement issued by Ruston & Hornsby Limited for the year ended March 31, 1945, shows combined trading profits (after deducting E.P.T.) of the company and its wholly owned subsidiaries, together with dividends from other subsidiaries and associated companies, of £372,560 (£362,723). Debenture interest takes £22,441, and subsidiary companies' income tax and reserves £47,215, leaving profit of parent company (before income tax) of £302,904 (£292,485). Appropriations are made of £149,751 (£141,420) for income tax, £15,000 (same) to pension reserve, and £50,000 (£25,000) to post-war contingencies reserve. The ordinary dividend is 12½ per cent. and the carry-forward is £60,143, against £60,615 brought in.

General Electric Co. Ltd.—For the year to March 31, 1945, the profit on trading of the General Electric Co. Ltd. and its income from investments amounted to £1,880,697 (£1,812,409.) Net profit, after deducting £458,588 (£460,699) for depreciation, £3,000 (£4,335) for directors' fees, and £115,990 (£106,645) contribution to pension fund, came to £1,303,119 (£1,240,730) to which has to be added £865,134 brought forward, making a total balance available of £2,168,253 (£2,058,492). The directors recommend a transfer of £700,000 (same) to income tax reserves, and a dividend on the ordinary stock at the rate of 10 per cent. per annum, less tax, together with a bonus of 7½ per cent. less tax, leaving £964,270 to be carried forward. These distributions are unchanged.

Letters Patent Application.—Letters patent were granted to Edwin Gustave Staude of 2675, University Avenue West, St. Paul, State of Minnesota, U.S.A., Engineer, bearing date July 3, 1929, Number 342,756, for the invention of "Improvements in or relating to Brake Mechanisms." It is notified that Mr. Staude intends to present a petition to H.M. High Court of Justice praying for an extension of time within which to make the application and for an extension of the term of the said letters patent. On October 16, or such later date as the Court may appoint, application will be made to the Court that a day be fixed before which the petition will not be in the paper for hearing. Notices of objection must be lodged by October 16.

B.A. Pacific and Argentine G.W. Payments.—The Buenos Ayres & Pacific Railway Co. Ltd. is paying one year's interest on its 4½ per cent. consolidated debenture stock, which follows a year's payment made last February and clears arrears up to January 1, 1942. The

British and Irish Railway Stocks and Shares

Stocks	Highest 1944	Lowest 1944	Prices July 31, 1945	Prices Rise/Fall
G.W.R.				
Cons. Ord.	62¾	55	51xd	– 5½
5% Con. Pref. ...	122½	114¾	117¼xd	– 4
5% Red. Pref. (1950)	110½	104	104xd	– 1
5% Rt. Charge ...	135½	128	130½	– 1
5% Cons. Guar. ...	134⅞	125	127½xd	– 2
4% Deb.	118¾	112¾	112	– 1½
4½% Deb.	118½	114	115½	—
4½% Deb.	124½	119½	121½	—
5% Deb.	137	129½	135½	—
2½% Deb.	77	73½	76½	—
L.M.S.R.				
Ord.	34⅜	27⅛	24¾	– 3¼
4% Pref. (1923) ...	64½	55	51½xd	– 7½
4% Pref.	81	72¼	71½xd	– 6½
5% Red. Pref. (1955)	105⅞	102	102½	– 1
4% Guar.	107½	99¼	101xd	– 2½
4% Deb.	111¼	104	108½	– ¼
5% Red. Deb. (1952)	111	108	108½	—
L.N.E.R.				
5% Pref. Ord. ...	10½	7⅞	6¾	– 1
Def. Ord.	5⅞	3¾	3½	– ⅛
4% First Pref. ...	68¼	55½	51¼xd	– 5¼
4% Second Pref. ...	35⅜	28½	26½xd	– 2½
5% Red. Pref. (1955)	101	97½	99½xd	– 1½
4% First Guar. ...	101½	96⅜	99¼xd	– 2
4% Second Guar. ...	95½	88½	92¼xd	– 3
3% Deb.	88⅛	80⅜	87	– 1
4% Deb.	110½	103½	107	– 1
5% Red. Deb. (1947)	105⅜	101½	101½	—
4½% Sinking Fund Red. Deb.	107	104½	104½	—
SOUTHERN				
Pref. Ord.	80½	71⅞	70xd	– 6½
Def. Ord.	26⅜	23	22	– 2½
5% Pref.	122	113½	116¼xd	– 4
5% Red. Pref. (1964)	117½	112½	114¼xd	—
5% Guar. Pref. ...	134	125½	128¼xd	– 1
5% Red. Guar. Pref. (1957)	115½	112½	114¼xd	– 1
4% Deb.	118	110	111½	– 1½
5% Deb.	135½	127	133½	– 1
4% Red. Deb. (1962-67)	111½	107½	109½	—
4% Red. Deb. (1970-80)	112	108½	110½	—
FORTH BRIDGE				
4% Deb.	107	103	104	—
4% Guar.	106½	102	104	—
L.P.T.B.				
4½% "A"	125	119	120½	– 1
5% "A"	133½	128	130½	– 1
3% Guar. (1967-72)...	99½	98	99	—
5% "B"	124½	118⅞	119½	– 1
"C"	72½	64½	64½xd	– 3
MERSEY				
Ord.	35½	33	35½	– 1
3% Perp. Pref. ...	72	66	74	—
4% Perp. Deb. ...	105	103	105	—
3% Perp. Deb. ...	85½	79½	93	—
IRELAND*				
BELFAST & C.D.				
Ord.	9	6	6½	—
G. NORTHERN				
Ord.	33⅜	19	27½	– 1¾
Pref.	49	37	44½	– 2½
Guar....	70	57⅞	72	– ¼
Deb.	90½	81½	92	+ ½
IRISH TRANSPORT				
Common	—	—	76¾	– 2
3% Deb.	—	—	100	—

* Latest available quotation

OFFICIAL NOTICES

None of the vacancies on this page relates to a man between the ages of 18 and 50 inclusive unless he is excepted from the provisions of the Control of Engagement Order, 1945, or the vacancy is for employment excepted from the provisions of that Order.

OFFICIAL ADVERTISEMENTS intended for insertion on this page should be sent in as early in the week as possible. The latest time for receiving official advertisements for this page for the current week's issue is 9.30 a.m. on the preceding Monday. All advertisements should be addressed to:—*The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

OVERSEAS EMPLOYMENT.—OFFICE ASSISTANT TO THE CHIEF ENGINEER required by the Kenya and Uganda Railways for one tour of 24 to 48 months with possible permanency. Salary £600 rising to £720 a year. On salary of £600 war bonus between £65 and £170 according to number of dependants is payable to married men. Free passages and quarters. Candidates must have a working knowledge of railway civil engineering accounting and costing methods, contracts and also of the general principles of labour management, and be fully conversant with modern office methods. Membership of the Institute of Transport, would be an advantage.

Applications, which must be in writing, stating date of birth, full details of qualifications and experience including present employment; also Identity and National Service or other registration particulars, and quoting Reference No. O.S.990, should be addressed to the Ministry of Labour and National Service, Appointments Department, Sardinia Street, Kingsway, London, W.C.2.

Universal Directory of Railway Officials and Railway Year Book

50th Annual Edition, 1944-45
Price 20/- net.

THE DIRECTORY PUBLISHING CO., LTD., 33, Tothill Street, Westminster, S.W.1

Argentine Great Western Railway Co. Ltd. is paying a year's interest on its 5 per cent. debenture stock to April 1, 1942, following a payment made last February of a year's interest to April 1, 1941.

Welsh Railway Reopens.—The G.W.R. branch line between Wrexham and Rhos, a distance of 4 miles, is to be reopened for passenger traffic during the Welsh National Eisteddfod week (August 6-11) at Rhos. Seven special trains will leave Wrexham for Rhos daily throughout the week. The passenger service on this branch was discontinued on January 1, 1931.

Vickers Limited.—At a meeting of the board of Vickers Limited on July 19, the undermentioned interim dividends were declared:—2½ per cent. actual, less tax, on the preferred 5 per cent. stock; 2½ per cent. actual, less tax, on the 5 per cent. preference stock; 2½ per cent. actual, free of tax up to 6s. in the £, on the cumulative preference stock. Payment will be made on August 17.

Emu Bay Railway Co. Ltd.—The profit and loss account and the report of the Emu Bay Railway Co. Ltd. for the year ended December 31, 1944, show a revenue of £102,905, and an expenditure of £92,293. The outgoings included £82,391 for traffic expenses, maintenance, management, etc., and £5,642 for depreciation, and the balance carried down was £10,612 which, with £19 brought forward makes £10,631 available for appropriation. Interest for the year 1944 and interest arrears on the 4½ per cent. irredeemable debentures stock take £8,509 and provision for exchange takes £2,114, leaving £8 to be carried forward. The length of line open is 88 miles on the 3-ft. 6-in. gauge.

Great Northern Railway Company (Ireland).—The directors of the Great Northern Railway Company (Ireland) have decided, subject to audit, to pay on September 1 next an interim dividend of £2 per cent. (less income tax) in respect of the year 1945 to the holders of the consolidated 4 per cent. guaranteed stock who will be registered at the closing of the transfer books on August 7. In view of the uncertain outlook for fuel supplies consideration of the payment of dividends on the preference and ordinary stocks was deferred until the end of the year.

Madras & Southern Mahratta Railway Co. Ltd.—The statement by the liquidators of the Madras & Southern Mahratta Railway Co. Ltd. for the period April 1, 1944, to March 31, 1945, shows on the receipts side: cash £320,094, investments £1,556, repayment of capital stock £5,275,000, guaranteed interest £21,875, part of surplus profits for 1943-44 £119,791, dominion income tax relief on taxation of guaranteed interest £70,273, sale and redemption of investments £48,525, interest received £6,986, and miscellaneous £367, making £5,864,468. Payments were: dividend arrears £445, first distribution of capital assets at £110 per cent. £5,489,568, directors' compensation for loss of income £5,200, London office staff compensation for loss of income £49,587, costs of liquidation £7,590, and balances at March 31, 1945—cash £310,523, and investments £1,555.

Reopening of the Vale of Rheidol Branch.—The Vale of Rheidol branch of the G.W.R. was reopened on Monday, July 23, with a passenger service of two trains in each direction (weekdays only), leaving Aberystwyth at 9.45 a.m. and 2 p.m., and Devil's Bridge at 11.30 a.m. and 4.15 p.m. The line is worked on the "one engine in steam" principle. The service will continue until Saturday, September 29. Parcels and freight traffic continues to be conveyed by road.

Railway Wage Claims.—On Tuesday and Wednesday last, representatives of the railway companies and trade unions discussed claims which had been put forward by the men's representatives for increases in wage rates and improvements in working conditions. The employers' delegation consisted of Mr. O. Cromwell (Southern Railway), Mr. H. J. Comber (L.M.S.R.), Mr. H. Adams-Clarke (G.W.R.), Mr. H. H. Halliday (L.N.E.R.), and Mr. G. H. Brooks (L.P.T.B.). The union delegation was headed by Mr. J. Benstead (N.U.R.), Mr. W. P. Allen (A.S.L.E. & F.), and Mr. C. N. Gallie (R.C.A.).

Prize-Winning L.P.T.B. Station Garden

First prize in the L.P.T.B. annual station gardens competition has been awarded to Ladbroke Grove Station. Inspecting the garden (left to right), are Messrs. R. C. Hyder, District Traffic Superintendent, Metropolitan & Bakerloo Lines; T. E. Thomas, General Manager; Evan Evans, Operating Manager (Railways); E. Walker, ticket collector (who designed the garden); E. Mansell, Stationmaster, Ladbroke Grove; A. G. Jenkins, clerk, Railway Department; G. Yorke, District Traffic Superintendent, District & Piccadilly Lines; W. E. Gurdon, Garden Superintendent; G. Fisher, clerk, Publicity Department

Contracts and Tenders

Below is a list of orders placed recently by the Egyptian State Railways:—

Arthur Balfour & Co. Ltd.: High-speed steel taps, reamers, drills and slatting cutters.
E. G. Herbert Limited: Saw blades.
John Spencer & Sons (1928) Ltd.: Helical springs.
Round Oak Steel Works Limited: Rail fasteners.
Spear & Jackson Limited: Hand tools.
North-West Rivet Bolt & Nut Factory Limited: Bolts and nuts.
Guest, Keen & Nettlefolds Limited: Mild steel screws, woodscrews, etc.
Richard Klinger Limited: Steam rail-car spares.
Pirelli-General Cable Works Limited: Cables.
Alfred Herbert Limited: Dies.
G. & J. Hall Limited: Taps, high-speed steel.
W. T. Henley's Telegraph Works Co. Ltd.: Cables.
Callender's Cable & Construction Co. Ltd.: Copper wire.
British Insulated Cables Limited: Cables.
Ferodo Limited: Asbestos.
Quasi-Arc Co. Ltd.: Electrodes.

Railway Stock Market

Stock markets reflected the initial repercussions of the election result, prices in most sections recording heavy declines, more particularly home rails, colliery shares, and securities of other industries whose prospects may be affected by nationalisation developments. The election result came as a complete surprise to the City, where there now appears to be a tendency to over-emphasise nationalisation fears and the many other uncertainties arising from the change of Government. Selling has not been on as large a scale as might be deduced from the decline in prices, which was accentuated by the fact that there is little new buying in evidence.

As was to be expected, there is a waiting attitude pending the King's Speech and the opening of Parliament on Wednesday, August 15, when the intentions of the new Government should be more clearly indicated. The fall in industrials has been widespread and embraced shares of many companies unlikely to be affected by nationalisation developments. This arises from general market conditions and also from the fear that the new Government may not favour a reduction in E.P.T. Devised to "take the profit out of war," E.P.T. bears so heavily in many cases that it precludes not only higher dividends but also the building up of adequate reserves. Many industrial shares in recent months attracted attention on the belief that E.P.T. would be reduced and permit of improvement in dividends over the moderate levels ruling in recent years. Gilt-edged provided the only section to show a rallying tendency. This reflected a safety first policy on the part of investors who were taking profits on industrials and reinvesting in British Funds and other high-grade stocks.

With the threat of nationalisation governing sentiment, home rails have declined sharply, and were unaffected by the divergent views current in the City as to the basis of "fair compensation" for stockholders in the event of nationalisation. It is impossible, of course, to predict events, but it is pointed out that the railways repeatedly have emphasised their right to standard revenue as defined in the 1921 Act, and that, even taking the most pessimistic view, home railway stocks are probably moderately valued at current levels. When it is possible to form a considered opinion of the position there may be scope for a good rally, but meanwhile, with uncertainty the keynote of markets, prices may go even lower. Nevertheless, the reduced levels are attracting a little buying in view of the very large yields and the prospect of the fixed rental agreement continuing for another two years with dividends maintained at current rates.

Compared with a week ago, Great Western has declined from 56½ to 51¾ xd, the 5 per cent. preference from 121½ to 118¼xd, and the guaranteed stock from 129½ to 128xd, while the 4 per cent. debentures were fractionally lower at 113½. L.M.S.R. was 25½, compared with 28⅜ a week ago, the senior preference declined from 78 to 71½xd, and the 1923 preference from 59 to 52xd. L.M.S.R. 4 per cent. debentures were 108½, against 109 a week ago. L.N.E.R. second preference declined from 29⅞ to 26¼xd, the first preference from 57 to 51xd, the first guaranteed from 101⅛ to 99½xd., and the second guaranteed from 95½ to 93xd. Southern deferred was 22½, compared with 24, the preferred 70⅜xd, compared with 76½; the 5 per cent. preference receded from 119 to 117½xd and the 4 per cent. debentures from 113 to 112½. London Transport "C" (68 a week ago) was 65xd, the 4½ per cent. "A" moved back from 121⅜ to 120⅜, and the 5 per cent. "B" from 121 to 119½. Metropolitan Assented stock remained at 57¾.

Argentine rails were affected by the reactionary trend of markets, but declines were fractional in character. Buenos Ayres Great Southern was 10¾, compared with 11¼ a week ago, the 5 per cent preference 25, compared with 26, the 6 per cent. preference 16½, compared with 17½, and the 4 per cent. debentures 61½, against 62½.

Antofagasta preference eased to 41½, and San Paulo ordinary was 53xd, against 57 a week ago. Despite the dividend, Canadian Pacific Railway stock receded from 20 to 19⅞.

Traffic Table and Stock Prices of Overseas and Foreign Railways

	Railways	Miles open	Week ended	Traffic for week: Total this year	Traffic for week: Inc. or dec. compared with 1943/4	No. of Week	Aggregate traffics to date: Totals 1944/5	Aggregate traffics to date: Totals 1943/4	Aggregate traffics to date: Increase or decrease	Shares or Stock	Prices: Highest 1944	Prices: Lowest 1944	Prices: July 31, 1945	Yield % (See Note)
				£	£		£	£	£					
South & Central	Antofagasta (Chili) & Bolivia	834	22.7.45	29,080	+ 5,360	29	885,130	832,000	+ 53,130	Ord. Stk.	13½	9½	10½	Nil
	Argentine North Eastern ...	753	21.7.45	19,900	+ 1,931	3	57,837	52,250	+ 5,587	,,	6½	4½	9	Nil
	Bolivar	174	June, 1945	4,640	— 598	26	30,275	31,756	— 1,481	6 p.c. Deb.	18⅜	7½	8½	Nil
	Brazil	—	—	—	—	—	—	—	—	Bonds	19⅛	15	22½	Nil
	Buenos Ayres & Pacific ...	2,771	21.7.45	120,500	+ 3,625	3	359,000	347,875	+ 11,125	Ord. Stk.	7 1/16	3⅜	5½	Nil
	Buenos Ayres Great Southern	5,080	21.7.45	197,562	+ 16,000	3	560,000	532,187	+ 27,813	Ord. Stk.	14⅛	9⅜	10½	Nil
	Buenos Ayres Western ...	1,924	21.7.45	70,438	+ 4,438	3	204,063	197,688	+ 6,375	,,	13⅜	9½	10½	Nil
	Central Argentine	3,700	21.7.45	188,209	+ 15,028	3	547,453	544,591	+ 2,862	,,	10½	6⅜	7⅜	Nil
	Do.	—	—	—	—	—	—	—	—	Dfd.	4⅜	3	4½	Nil
	Cent. Uruguay of M. Video	972	21.7.45	37,057	+ 3,446	3	108,533	111,007	— 2,474	Ord. Stk.	5½	4	6	Nil
	Costa Rica	262	May, 1945	27,205	+ 680	38	259,151	251,679	+ 7,472	Stk.	17½	14½	14	Nil
	Dorada	70	June, 1945	33,780	+ 7,554	26	182,375	149,309	+ 33,066	1 Mc. Deb.	101	101	101½	£5 18
	Entre Rios	808	21.7.45	29,563	+ 5,294	3	81,175	72,012	+ 9,163	Ord. Stk.	6½	4½	5	Nil
	Great Western of Brazil ...	1,030	21.7.45	21,500	+ 2,900	29	721,400	636,200	+ 85,200	Ord. Sh.	38/-	23/3	25/-	Nil
	International of Cl. Amer. ...	794	June, 1945	$218,345	+ $102,796	22	$1,266,065	$1,208,112	+ $57,953	—	—	—	—	—
	Interoceanic of Mexico ...	—	—	—	—	—	—	—	—	1st Pref.	1½	½	1	Nil
	La Guaira & Caracas... ...	22½	June, 1945	7,106	— 1,171	26	36,929	46,430	— 9,501	5 p.c. Deb.	88	79	78½	£6 7 5
	Leopoldina	1,918	21.7.45	51,984	+ 5,803	29	1,398,486	1,303,815	+ 94,671	Ord. Stk.	5⅛	4½	4	Nil
	Mexican	483	21.7.45	ps. 595,300	+ ps. 206,300	29	ps. 1,706,700	ps. 1,404,200	+ ps. 302,500	Ord. Stk.	½	½	1½	Nil
	Midland Uruguay	319	May, 1945	19,738	+ 3,567	48	195,444	187,809	+ 7,635	—	—	—	—	—
	Nitrate	382	15.7.45	4,436	— 1,979	28	95,916	98,921	— 3,005	Ord. Sh.	75/10	65/10	70/-	£3 11
	Paraguay Central	274	20.7.45	£68,186	+ £7,580	3	£191,488	£173,831	+ £17,657	Pr. Li. Stk.	79½	68	77½	£7 14
	Peruvian Corporation ...	1,059	June, 1945	124,966	+ 3,615	52	1,554,661	1,330,647	+ 224,014	Pref.	9	10	9¼	Nil
	Salvador	100	May, 1945	c 112,200	+ c 18,000	48	c 1,420,000	c 1,404,000	+ c 16,000	—	—	—	—	—
	San Paulo	153½	—	—	—	—	—	—	—	Ord. Stk.	57¾	46	53½xd	£5 12
	Taltal	156	June, 1945	3,795	— 1,735	52	36,700	65,330	— 28,630	Ord. Sh.	21/3	13/9	13/9	Nil
	United of Havana	1,301	21.7.45	43,846	— 160	3	129,624	141,364	— 11,740	Ord. Stk.	4	2½	2	Nil
	Uruguay Northern	73	May, 1945	1,830	— 151	48	18,089	16,412	+ 1,677	—	—	—	—	—
Canada	Canadian National	23,569	June, 1945	1,869,600	+ 182,600	26	7,879,600	8,196,600	— 317,000	—	—	—	—	—
	Canadian Pacific	17,028	21.7.45	1,252,200	+ 36,800	29	34,757,000	34,547,000	+ 210,000	Ord. Stk.	17¾	13 11/16	20	£5
Various	Barsi Light †	202	June, 1945	19,620	— 4,185	14	74,595	75,487	— 892	Ord. Stk.	129½	97½	129½	£3 9 6
	Beira	—	May, 1945	76,561	— 13,371	38	—	—	—	—	—	—	—	—
	Egyptian Delta	607	30.6.45	15,035	— 2,248	12	145,448	167,409	— 21,961	Prf. Sh.	7⅛	5¼	6½	Nil
	Manila	—	—	—	—	—	—	—	—	B. Deb.	63½	58	60½	Nil
	Midland of W. Australia ...	277	May, 1945	17,489	— 4,344	48	207,237	312,987	— 105,750	Inc. Deb.	101½	99½	95½	£4 3 9
	Nigeria	1,900	26.5.45	277,630	+ 23,531	8	1,823,785	1,739,068	+ 84,717	—	—	—	—	—
	Rhodesia	—	May, 1945	496,777	— 59,229	38	—	—	—	—	—	—	—	—
	South Africa	13,301	23.6.45	1,003,946	+ 151,486	12	11,690,918	10,083,914	+ 1,607,004	—	—	—	—	—
	Victoria	4,774	Mar., 1945	1,303,804	— 60,124	39	—	—	—	—	—	—	—	—

Note. Yields are based on the approximate current price and are within a fraction of ⅛. Argentine traffics are given in sterling calculated @ 16 pesos to the £

† Receipts are calculated @ 1s. 6d. to the rupee